This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

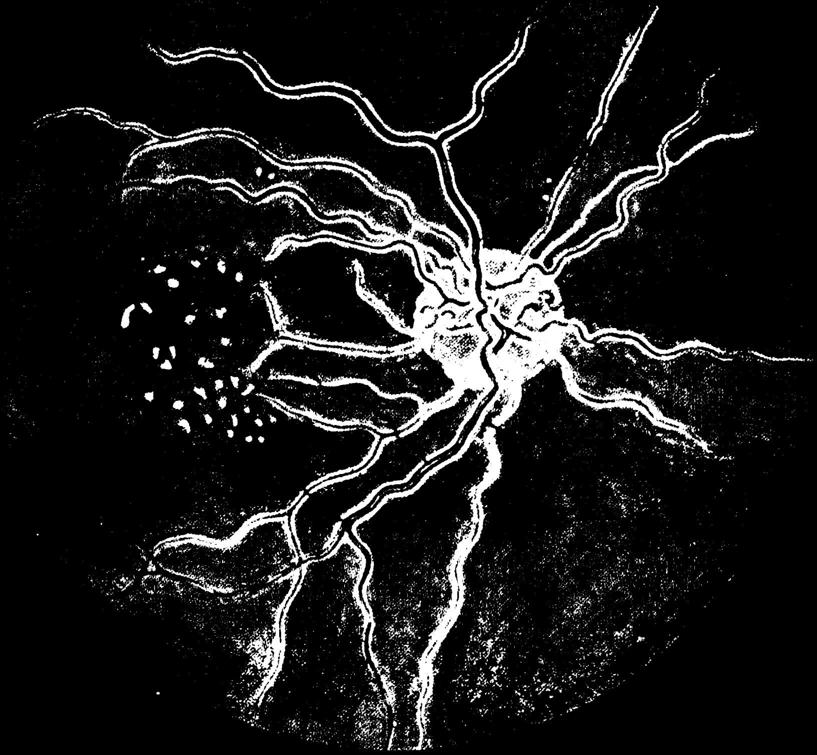
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

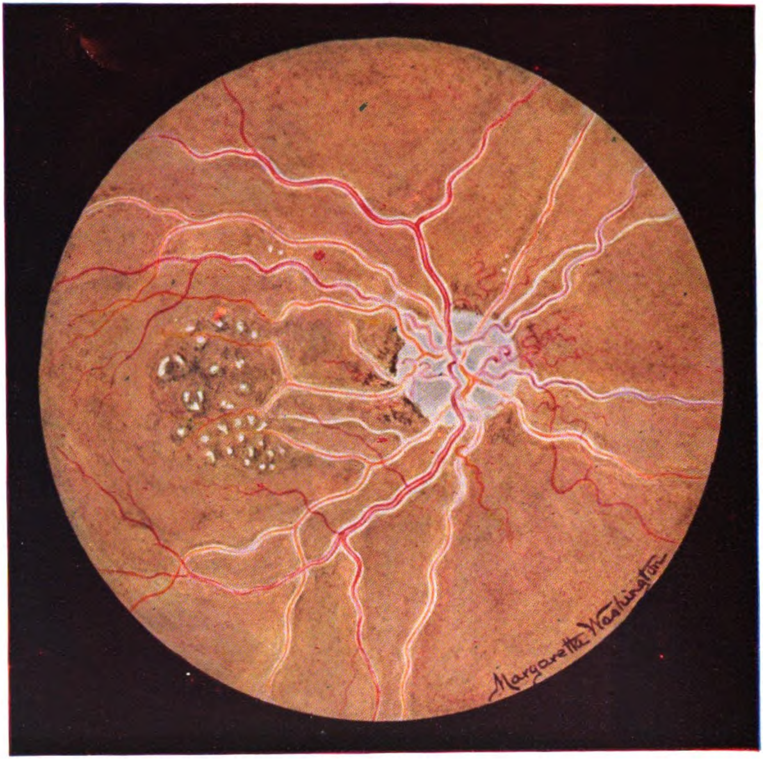


The Eye, Ear, Nose and Throat

Albert Henry Andrews, Casey A Wood,
George Elmer Shambaugh

M.T.

BOSTON
MEDICAL LIBRARY
8 THE FENWAY



Syphilitic Arteritis with Optic Atrophy—(POSEY AND KRAUSS)

THE

PRACTICAL MEDICINE SERIES

COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY

UNDER THE GENERAL EDITORIAL CHARGE OF

GUSTAVUS P. HEAD, M. D.

PROFESSOR OF LARYNGOLOGY AND RHINOLOGY,
CHICAGO POST-GRADUATE MEDICAL SCHOOL

VOLUME III.

THE EYE, EAR, NOSE AND THROAT

EDITED BY

CASEY A. WOOD, C. M., M. D., D. C. L.
ALBERT H. ANDREWS, M. D.
GUSTAVUS P. HEAD, M. D.

SERIES 1909

CHICAGO
THE YEAR BOOK PUBLISHERS
40 Dearborn Street

BOSTON
JUN
LIBRARY

COPYRIGHT 1909
BY
THE YEAR BOOK PUBLISHERS.

CATALOGUED
JUN 11 1909
J. F. B.

Departments.

The Eye.

CASEY A. WOOD, C. M., M. D., D. C. L.

Professor of Ophthalmology, Northwestern University; Ophthalmic Surgeon to St. Luke's and Wesley Hospitals; Consulting Ophthalmic Surgeon Cook Co. Hospital, Chicago, etc.

The Ear.

ALBERT H. ANDREWS, M. D.

Professor of Otology, Rhinology and Laryngology, Chicago Eye, Ear, Nose and Throat College; Oculist and Aurist to the Chicago, Rock Island & Pacific Railway; etc.

The Nose and Throat.

GUSTAVUS P. HEAD, M. D.

Professor of Otology, Laryngology and Rhinology, Chicago Post-Graduate Medical School.

TABLE OF CONTENTS.

PAGE
Introduction 4

THE EYE.

Examination of the Eye 9
Refraction, Ametropia and Its Treatment 16
Hygiene of the Eye 26
Bacteriology 33
The Eyelids 39
The Conjunctiva 42
The Cornea 50
Diseases of the Lens, Cataract 58
The Uveal Tract 70
The Lacrimal Apparatus 74
Optic Nerve and Retina 79
Toxic Amblyopia 98
The Ocular Muscles 107
The Orbit 114
Glaucoma 117
Ocular Injuries 122
Ocular Symptoms in General Diseases 132
Ocular Tumors 144
Instruments and Appliances 147
Ocular Therapeutics 153

THE EAR.

Middle Ear 177
The Mastoid 197
Brain and Sinus 205
Internal Ear 221
Miscellaneous 238

THE NOSE AND THROAT.

PAGE

The External Nose 245
Fractures and Deformities 249
Physiology 251
The Septum 254
The Turbinate Bodies 257
The Accessory Cavities 271
Nasal Tuberculosis 290
Epistaxis 292
Nasal Reflexes 292
Nasal Tumors 294
The Nasopharynx 295
The Pharynx 299
The Mouth 300
The Tonsils 301
The Larynx 310
The Voice 332
The Trachea 337
The Bronchi 339
The Esophagus 341
Hay Fever 342
Miscellaneous 346

THE INTRODUCTION.

During the year 1908 there has been in the department of ophthalmology a decided advance in the diagnosis and treatment of certain common diseases—perhaps the most marked progress being in the bacteriology of trachoma. This matter will be discussed under the caption "Conjunctiva." The Ophthalmo-tuberculin reaction has been thoroughly tested and its place in ophthalmology is now fairly well defined.

Altogether, the relations between ophthalmology proper and general medicine have been discussed with greater thoroughness and a better understanding arrived at during the past year than has obtained in former years. This is particularly true of syphilis, tuberculosis, brain tumor and diseases of the neighboring cavities.

As in former years, the space at the Editor's disposal is entirely inadequate even to notice the large number of meritorious papers contributed during the past year to the literature of ophthalmology. He has been placed in the embarrassing position of desiring to refer to them without the means of doing so. With this purpose in view, however, he has omitted a number of illustrations for the purposes of abstracting some articles that would otherwise have to be omitted.

As usual, the Editor has made extensive use of the valuable excerpts and translations from "Ophthalmology," and wishes to thank Dr. H. V. Würdemann and his admirable corps of collaborators for the privilege.

CASEY WOOD.

Chicago, May, 1909.

BOSTON ME
JUN 1

THE EYE.

EXAMINATION OF THE EYE.

A New Pupillary Phenomenon. In long, continuous and extensive muscular contraction Redlich[1] observed *maximal pupillary contraction with a loss of reaction to light.* No satisfactory explanation of this phenomenon has as yet been given. It is possible that its cause might be found in the changed condition of tension and circulation. If an irritation of the sympathetic were the cause of it we would expect to find the pupil dilated, but the reaction to light would not be lost.

Westphal considers the symptom as one of general muscular rigidity.

An Improved Retinoscopic Mirror. Bradburne[2] describes the well known double mirrors which are hinged together for protection and fitted with a triangular carrier behind the sight hole. This carrier is fitted with a + 2.D and + 4.D lens, and a center hole which is unglazed.

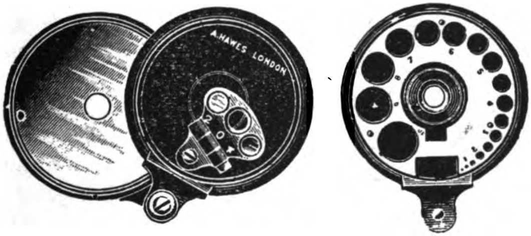


Fig. 1. Improved Retinoscopic Mirror—Bradburne.

They can be rotated at will over the sight hole of the mirror, and are of advantage because of increased magnification. Their use also lessens the distance at which the observer has to stand from the eye of the patient.

---

[1] Wien. med. Woch., Aug. 22, 1908.
[2] Ophthalmic Record, March, 1908.

Inspection of the Ocular Fundus by Transillumination of the Orbit From the Nasopharynx. The ophthalmo-diaphanoscope of Hertzell[1] is introduced into the mouth and furnishes a light of 50 candlepower, the effect of which is increased by suitably arranged reflectors. The face, except the eyes, is covered by a black mask. The apparatus contains three lamps, between which the cooling water circulates. It uses 1½ to 2 amperes and can be directly connected with a current of 110 volts. No special rheostat is required. It may be procured from Doerffel and Faerber, Chausseestrasse 10, Berlin, Germany.

An ophthalmoscopic view is obtained by direct inspection without other means; cases of ametropia necessitate correcting glasses for the observer.

The advantages of the instrument are said to be simplification of the otherwise complicated technic of seeing by means of an apparatus; exclusion of the disturbing reflexes, as the light emanates from the interior of the eye; absolute darkness in the room; greatest extension of the visual field in the erect image, on account of the possibility of immediate approach to the eye.

The new method may help us to recognize certain diseases, especially of the walls of the globe and behind the orbit, for which the ophthalmoscopic examination is not sufficient. Hertzell succeeded by his method in focusing the inverted image of the transilluminated optic disc, by means of a lens, objectively visible, though indistinct, on a white screen, held before the eye.

The removal of the disturbing reflexes will make it especially valuable for the photography of the background.

The Eyes of Plants. Macdougal, Harold Wager and Prof. Haberlandt are quoted by the *Scientific American*[2] on the subject of the *sensitiveness of plants to light.* The upper and lower surfaces of leaves are covered by a thin transparent skin, which can, in many cases, be very easily peeled off. When examined under the microscope this skin is seen to consist of innumerable compartments or

---

(1) Berlin. klin. Woch., p. 1149, 1908.
(2) Oct. 17, 1908.

cells, many thousands of which are found on a single leaf. They contain a clear watery sap, and their shape is such that they behave like ordinary convex or plano-convex lenses, the rays of light which fall upon them being converged and brought to a focus in the substance of the leaf. These cells probably enable the plant to perceive the difference between light and dark, and set up a stimulus which results in the movement of the leaf into such a position that it can obtain the maximum amount of light; or it may be that they serve for the more efficient illumination of the green grains within the leaf upon which the effective food supply of the plant depends. Possibly both play some part in aiding the leaf to perform its work more efficiently. These cells are found in practically all plants. In many cases these lens-cells may be compared with the corneal facets of an insect's eye, so far as their general appearance and power of causing a convergence of light are concerned.

The Tuberculin (Calmette) Ophthalmo-Reaction is still the subject of much favorable and some unfavorable comment. For example, three of T. H. Butler's[1] cases have done so badly that he believes that the dangers of the Calmette reaction are very real, and that, since the reaction is by no means conclusive, it is hardly a justifiable method of diagnosis.

In the first case a typically tuberculous process was set up in a perfectly healthy eye as a result of the instillation of tuberculin; a central corneal nebula will permanently reduce considerably the acuteness of vision.

In the second example, although there was no complication of the cornea, a violent reaction was followed by chronic conjunctivitis with much thickening and a very chronic phlyctenule.

In the third patient a very violent mucopurulent conjunctivitis occurred and resisted all treatment for two months. In none of these three cases was there pre-existing eye disease.

Ernest Thompson[2] notes that *constitutional reaction has been reported by several observers.* Tuberculin causes

---

(1) **British Med. Journal, Aug. 8, 1908.**
(2) **The Ophthalmoscope, July, 1908.**

movements of the tuberculo-opsonic index similar to those which follow a subcutaneous injection. Napier reports 2 cases where tuberculin was administered subcutaneously after use of the Calmette's test, and in each case a severe conjunctivitis came on some weeks later in the eyes to which only the test had been applied. The inference made is that the ocular test causes a local change of some kind which responds sharply to the introduction of tuberculin into the circulation. The local reaction on diseased eyes is generally considered to be dangerous. Many cases have been reported where the eyes had been permanently damaged. Very severe conjunctivitis, lasting many weeks, has been reported by a number of observers. Phlyctenular keratitis has followed in a few cases. Where one eye is healthy and the other diseased, especially with a keratitis of doubtful tubercular character, the application of the test to the apparently healthy eye is fraught with danger. Knapp reports such a case.

Bearing on this question, Lapersonne has published in the *Presse Medicale* an article in the course of which he considers the injurious effects imputed to the Calmette procedure and has stated that the dangers are insignificant and that the positive oculo-reactions which have been obtained are considerable in number. Brunetiere[1] in this connection remarks that for two months past there have been many oculists who object to the new method. Kalt reported a case in which he attributed aggravation of tubercular intraocular lesions to the ophthalmo-reaction. Morax believed in that case the aggravation was a coincidence. Brunetiere is of the opinion that the cases in which complications arise are few. He reports a case of phlyctenular conjunctivitis in which the opththalmo-reaction apparently gave threatening symptoms, which, however, subsided later.

The active introduction and general use of the ophthalmo-reaction have caused Trousseau[2] to point out the *dangers of this tubercular test.* Facts accumulate which show that the measure is not free from risk. Ordinarily the reaction appears in from 5 to 8 hours, and between

---

(1) La Clinique Ophtal., Jan. 25, 1908.
(2) Clinique Optal., Jan. 25, 1908.

12 and 20 hours its maximum is reached; after that time a recession should take place. If the reaction is very violent it may last several days. Trousseau relates a case of a child of 7 years that prior to an attack of measles had had excellent health. Following the measles the child had phlyctenular conjunctivitis, for which yellow ointment was applied. Last November a slight bronchitis appeared and the parents wished the test of the ophthalmo-reactions made, the application of which was followed by a severe swelling of the lids with abundant secretion. Twenty-one days afterward the child was brought to Trousseau, and the removal of the conjunctival condition required active treatment for some time. The author believes the trouble to have been caused by the tuberculin.

An instance of *serious impairment of vision following the use of ophthalmo-reaction* for the purpose of diagnosing tubercle is also reported by Maitland Ramsay.[1] The patient, a girl of 12, was suffering from superficial vascular ulceration of the right cornea. There was a history of a similar attack in the left eye 2 years before and, though careful examination revealed no sign of tubercle in the lungs or abdomen, both cervical and submaxillary glands were much enlarged. One drop of 1 per cent. solution of tuberculin was instilled into the left eye, which was at that time perfectly free from inflammation, though there was a faint nebula on the cornea, the result of a previous attack of ulceration. Within 24 hours there was violent mucopurulent reaction, the discharge being very abundant and accompanied by marked swelling of the lids and thickening of the palpebral conjunctiva. The inflammation could not be influenced by treatment and progressed until the cornea quickly became vascular and abraded over the central area. Ten days after the instillation, 0.25 cubic cm. of 1-1000 solution of Koch's old tuberculin was injected subcutaneously. This was followed by a rise of temperature and resulted in great improvement in the right eye, though the left remained unchanged. Subsequently the old tuberculin was injected twice, the first time to the amount of 0.25 cubic cm., and the second time to the amount of 0.5 cubic cm.; 7 weeks after admission the

---

(1) The Lancet, March 7, 1908.

right eye was almost recovered, while in the left the discharge had begun to lessen. Subsequently the improvement in the latter was steady, but there remained, as a result of the Calmette instillation, a considerable opacity of the center of the cornea, and in consequence the vision was seriously impaired.

The *reaction of tuberculin on the conjunctiva,* as it is employed at the present time, has, according to Collin,[1] *the following disadvantages and dangers:* Children and very sensitive adults compress forcibly the eyelids after a drop of tuberculin is instilled, expressing thereby a good deal of the fluid, thus preventing its absorption. The amount absorbed cannot be properly estimated. The author advises an instillation of a 3 per cent. cocain solution for from 5 to 10 minutes before the instillation of the tuberculin.

Tuberculin is contraindicated in cases of trachomatous, follicular, phlyctenular and catarrhal conjunctivitis, not only because the specific reaction is obscured in these affections, but also because the procedure may endanger the eye which had already been affected.

Instillation of tuberculin into the conjunctiva is not without danger to the eye, because the inflammation which follows the procedure does not disappear very readily, and frequently produces marginal ulcers of the cornea, which may lead to perforation. In one case a vaccine tuberculosis of the conjunctiva was produced.

Frank Brawley[2] concludes, from a study of the reported cases, it would seem that *much work is yet to be done before the ophthalmo-tuberculin reaction and its relation to general tuberculosis are fully determined.* Exhaustive eye tests with suspensions of various percentage strengths of tuberculin, controlled by skin tests, tuberculin injections and the opsonic index for tubercle bacilli, must be made before we can decide upon the exact value of the procedure and its possibilities of harm to such a delicate organ as the eye, especially in the presence of the various ocular diseases. Second eye tests should be made in the opposite eye where possible, or in the same eye at long intervals,

---

(1) Medizin. Blaetter, Feb. 15, 1908.
(2) Ophthalmic Record, April, 1908.

as the experience of the majority of observers seems to show that the test has a cumulative effect, rendering the eye more sensitive or possibly causes mechanical irritation if used too often in increasing dosage.

The effect of the ophthalmo-tuberculin reaction in apparently normal individuals also requires exhaustive study controlled by thorough, painstaking general examinations.

The Ocular Typhoid Reaction. Walter Hamburger[1] reports 48 cases. By the instillation into the eyes of typhoid patients of one drop of an extract of the typhoid bacillus, a reactive inflammation has been caused which is probably specific and possibly universal. In diseases other than typhoid, a less intense and shorter reaction occasionally appears which in most cases may easily be differentiated. These results agree closely with those obtained with the alcoholic precipitate of Chantemesse.

Sero-Diagnosis of Syphilis in Ophthalmology. Cohen[2] has experimented with the serum reaction of Wassermann, Bruck and Neisser on 64 eye patients. These were grouped as positively syphilitic, doubtfully syphilitic and suspected of syphilis. In 23 cases the reaction was positive, 8 of these being positively syphilitic, 6 of which had iritis. Out of 41 cases with negative reactions 5 had clinically been diagnosed as syphilitic. In the remaining 36 there was, besides the eye affection, no other sign of syphilis. The cases are arranged in tabular form; some are reported in greater detail. Cohen reached the following conclusions: Wassermann's reaction in ophthalmology, if negative, gives certain diagnostic hints. If positive, it may be decisive for diagnosis and treatment.

The Advantages of Paraffin as an Embedding Material in Eye Pathology. Pollock[3] discusses the *advantages of paraffin as compared to celloidin* in the preparation of an eye for microscopical examination:

Paraffin holds all the parts together so that there is no fear of getting them disturbed after cutting, just as celloidin does. The method of fixing is, however, important, for if the lens and sclera are rendered too hard and brittle

---

(1) Jour. Am. Med. Assoc., April 25, 1908.
(2) Berlin. klin. Woch., p. 877, 1908.
(3) The Ophthalmic Review, September, 1908.

it may be impossible to obtain good sections. If the examination in the lens in patients over 30 is not important, the writer removes the portion in the half eye used for sections in order to save the edge of the razors. If the eye is kept too long in the paraffin bath a certain amount of distortion may occur. With regard to sections "being disturbed after cutting," this is largely a matter of technic and gentleness of touch; but a method of avoiding all risk is described.

The removal of the paraffin from the sections takes scarcely more than three minutes, and as it is done by placing the slide with section in a tube of xylol, no trouble is entailed.

The manipulation of cut sections is a simple matter, even when they curl up.

Paraffin sections can be kept for an indefinite time between layers of paper, and paraffin blocks are more easily stored in permanent form than celloidin.

Paraffin sections may be cut of extreme thinness.

Paraffin is unsurpassed by any other method for obtaining serial sections.

Pollock describes his method of procedure which has given him the greatest satisfaction, describing the fixing, staining, cutting and mounting of sections and the method of preserving half eyes.

REFRACTION. AMETROPIA AND ITS TREATMENT.

Refraction of Wild Indians Fresh from the Plains. About 35 per cent. of aborigines admitted to Hampton Institute were found by C. P. Jones[1] to have refractive errors requiring glasses to improve vision or relieve eye strain. Of these, about two-thirds had hyperopia with or without astigmatism. Myopia was very rare. It was noted that the reported remarkable eyesight of savages,

---

(1) Jour. Am. Med. Assoc., July 25, 1908.

sailors, hunters, and so on, has no relation to the refraction. Many of these individuals are ametropic and have sub-normal vision as tested by the optotypes, but keen sight for objects with which they are familiar. Visual association and intimate acquaintance with the environment account for these conditions as well as for many feats of markmanship.

Verhoeff's Astigmatic Charts. John Green, Jr., in a paper on this subject remarks that in the *Ophthalmic Record,* November, 1899, F. H. Verhoeff described two new astigmatic charts which differ in some important respects from the sun-ray figure, the various charts of Green and the radiating lines in groups of three of Wallace. I quote from his article:[1] One chart is intended solely for deter-

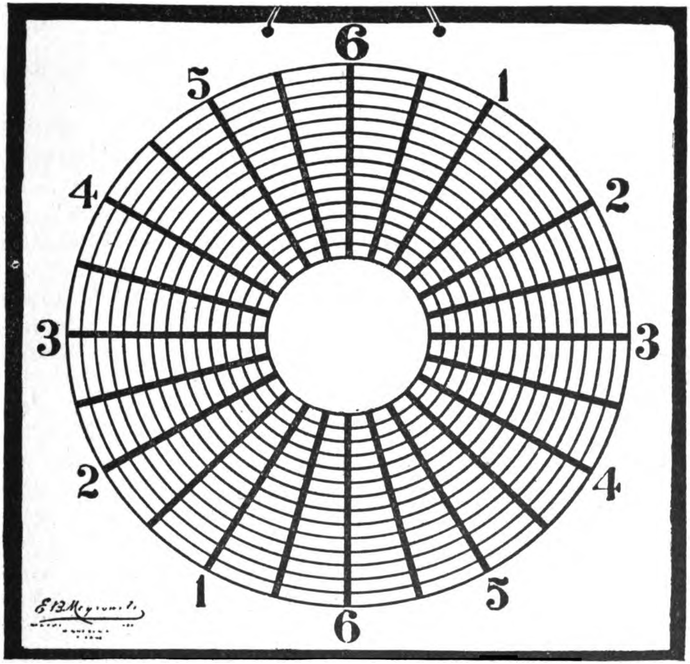


Fig. 2. Verhoeff's Astigmatic Charts. Chart 1.

---

(1) Ophthalmology, April, 1908.

mining the axis, the other primarily for estimating the amount, of astigmatism. Chart 1 consists of a series of wide lines (width 3.75 mm.) radiating from a common center and placed at 15° intervals. These lines are crossed by concentric narrow lines (width 1.1 mm.), forming a series of circles separated from one another by equal intervals of 6.5 mm. The diameter of the disc is 31 cm. The wide radiating lines are designated by numbers 1, 2, 3, 4, 5, 6, corresponding on the right semicircle to the figures on a clock face and on the left semicircle to these lines extended. In a chart as published the vertical line above is marked 12, but this number has been replaced by 6 to secure uniformity and avoid confusion.

Chart 2 consists of a disc pivoted at its center to a square of white cardboard. Two wide lines (width 3.75 mm.) intersect at the center of the disc to form a right angle. Two sets of fine lines of varying lengths are drawn parallel to one of the wide lines and similar sets are drawn parallel to the other wide line in such a manner as to form a series of squares separated from one another by a uniform interval of 6.5 mm. Short marks on the white cardboard indicate axes from 0° to 180° at the usual 15° intervals.

In examining a patient without cycloplegia the lines are blurred with a suitable sphere, either + or —, in accordance with the spherical error in the case. The patient's attention is then directed to Chart 1 and he is asked to select the blackest or most sharply defined of the wide lines. The selection of this line is rendered easier by the fact that the fine lines crossing it are precisely the ones that are most blurred. Conversely, the wide line at right angles is seen to be especially blurred in contrast to the sharply outlined fine lines crossing it.

The patient is then directed to view Chart 2, which has been rotated to bring one of the wide lines in the axis as determined by Chart 1. This line will then stand out distinctly against the blur of the fine lines crossing it and, conversely, the other wide line will appear faint in contrast with the sharply outlined fine lines at right angles. Concave cylinders of varying strengths with axes at right angles to the sharp wide line are brought successively before the sphere until the patient is convinced that the two wide lines have been equalized. He is now asked to confine his attention to the quadrants of fine lines and requested to state whether they, too, present a perfectly uniform appearance. As a rule, one pair of sections will be selected

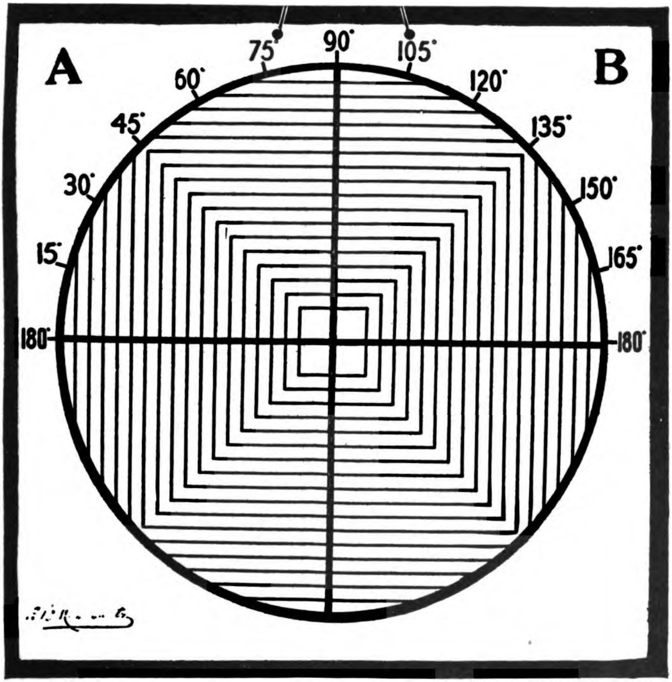


Fig. 3. Verhoeff's Astigmatic Charts. Chart 2.

sharper than the other, despite the fact that the wide lines appear absolutely uniform. The addition of a + or — .12 cyl. will almost invariably be all that is required to make the chart appear absolutely uniform.

At this point the patient's vision will be found in the neighborhood of 6/viii. The sphere is then altered to bring the visual acuity up to normal or a little above. Finally, the patient's attention being confined to the lowest line of letters, it will often be found that these can be appreciably sharpened by a slight change in the axis of the cylinder.

Chart 2 may also be used for determining the axis of astigmatism by rotating the disc back and forth until the more distinct of the two lines reaches a position at which it appears most distinct to the patient. Another method, first suggested by Verhoeff, is to rotate the chart until the two wide lines appear equally distinct. The axis will then lie half way between the two lines.

In using Chart 2 Green has sometimes found it a little difficult (especially with children and unintelligent adults) to get patients to understand precisely what they are intended to look for. In such cases he compares the chart to a pie divided into four slices, and asks whether the right and left slices are the blackest or the upper and lower ones. As a further aid toward designating the lines or quadrants when the axis is away from the vertical Verhoeff has placed the letters A and B on the cardboard of the chart to the right and left. He has also found it of advantage to mount Chart 1 on a larger card than that furnished by the publisher in order to designate the lines by larger numerals.

Some patients find it very difficult to concentrate their attention on the quadrants of fine lines, being unable, apparently, to disregard the vivid impression of the wide lines. For such individuals a chart similar to Chart 2, but without the wide lines (the axes being indicated by inconspicuous marks at the periphery only), would be of value.

C. N. Spratt has recorded the comparative results obtained with the use of the charts without cycloplegia and again after the instillation of homatropin 2 per cent. every ten minutes for a period of one and one-half hours. His report, based on the examination of 126 eyes, mostly in the young and middle aged, is as follows: In 75 per cent. there was no difference in the amount of astigmatism before and after cycloplegia. In 20 per cent. the astigmatism after cycloplegia was .25 D. (or less) greater than before cycloplegia. In four cases there was an apparent difference of .37 D. and in one case of .5 D. In the myopic cases 66 per cent. gave the same result before and after cycloplegia. Thirty-four per cent. were undercorrected from .12 D. to .37 D. without cycloplegia. In the hyperopic cases 42 per cent. were fully corrected without cycloplegia; the remainder were undercorrected from .12 D. to 1 D.

Green has had these charts in daily use for the past two years and has found them eminently satisfactory, so that he has to a large extent discarded other charts. He is convinced they furnish the best subjective method of determining astigmatism as to axis and amount and are deserving of a wider use than has hitherto been accorded them.

Comparative Potency of Hyoscin in Refraction Work. Reber[1] uses homatropin semi-occasionally, and atropin infrequently. During the last six years he has seen upward of 2,000 cases of refraction error in private practice, and has used a 1/10 per cent. solution of hyoscin hydrobromate, containing also 1/5 per cent. cocain. In about one case in fifty there is rather marked flushing of the face, quickening of the pulse and some slight vertigo, but not more than is sometimes seen with homatropin. Not once was pronounced "toxemia" noticed. Compression of the canaliculi immediately after instillation will prevent even the slightest constitutional reaction. The solution is instilled once or twice the evening before, and twice the morning of the examination. For office use cocain 2 per cent., warmed, is instilled, and the hyoscin dropped in, also warm, twice at intervals of a half hour. An hour later the testing may begin. Accommodation is sufficiently re-established for ordinary purposes at the end of 48 to 60 hours. It is not wise to attempt to hasten this by instilling eserin, as the benefit of the rest under a mydriatic is thus forfeited. The ideal would be to completely paralyze accommodation and put the internal ocular structures at perfect rest by atropin prior to testing the refraction, but "the tension of life in this year of grace 1908" makes it impossible, for practical reasons.

When and How Shall We Use Cycloplegics in Refraction Work? Duane[2] replies to this question by the follow-

---

(1) Jour. Am. Med. Assoc., April 25, 1908.
(2) N. Y. State Jour. of Med., July, 1908.

ing conclusions, based on long practical experience and a special series of tests:

1. A cycloplegic should be employed for determining the refraction in practically all cases, not glaucomatous, below 48 years of age and in some cases above this limit.

2. Homatropin in 2 per cent. solution, provided it is used with ordinary precaution, is a safe cycloplegic, and if properly used is effective in the vast majority of cases.

3. It should be repeatedly instilled and the examination made not less than an hour after the first instillation, nor until a test of the accommodation has shown that the latter is as completely abolished as possible.

4. The cases in which homatropin proves inefficient are few. They are marked by varying vision and varying acceptances, discrepancies between the subjective tests and the skiascopic findings, and the persistence of an undue amount of accommodation (more than one D) even after prolonged action and repeated instillations.

5. In such cases atropin should be used.

[In addition to these valuable conclusions of Duane, I should like to add that the matter of *time* is often of importance in the examination of patients. As a practical rule I would suggest the following: Whenever ciliary rest is needed as part of the treatment, it is wise to use atropin. Failing this cycloplegic, a single disc containing 1-2,000 of a grain of hyoscin hydrobromid placed in the eye five minutes after the instillation of one drop of a solution (2% each) of cocain and homatropin will produce a complete cycloplegia, without irritating the eye, two hours after the instillation of the mixture, the eye being kept closed about one-half of this time. The mydriasis lasts about three days. When ciliary rest is not especially required and the patient cannot give up near work for more than 24 hours, I would suggest that the discs of homatropin and cocain which I advocated some years ago, is the next most satisfactory method of inducing cycloplegia. —Ed.]

Value of Atropin and Homatropin Cycloplegia. A plea for the more general employment of atropin is made by Gratiot.(1) It is a reliable cycloplegic in all cases, allowing an accurate determination of the full static refraction, permits of more time in which to make one or more thorough examinations while the accommodation is completely paralyzed, and enforces ciliary rest, a decided benefit. Toxic symptoms are not rare, but can be guarded against. Conjunctivitis is seen, as a rule, only after prolonged use. Homatropin is more convenient, and is reliable in about 75 per cent. of the cases.

---

(1) Iowa Med. Jour., No. 5, 1908.

A Contribution to the History of Hyperopia. Blysma[1] states that Gottheff Kästner, of Leipzig, in 1755 published a volume with the title of "Vollstandiger Lehrbegriff der Optik," in which he describes the optical phenomena of hyperopia under the name of "hyperpresbyopia," and that Hess of Middleburg, in 1842 published a treatise entitled "Theoretical and Practical Manual of Mechanical Affection of the Eye, Vision, the Means by Which We See, the Physiological Functions of the Eye, the Properties and Errors of Glasses and the Art and Manner of Employing These in Mechanical Diseases of the Eye." In this work he classifies optical errors into Presbyta, Myopia Presbyopia (now Hypermetropia) and Presbymyopia. Under the term Presbyopia he gives a very accurate description of hypermetropia as a frequent congenital condition in which those affected with high degrees distinguish distant objects no better than nearby objects. He says that in contrast to the presbyopes and myopes the hypermetrope must wear their glasses constantly, as well for distant as near objects.

[If Blysma had consulted the interesting address of Hubbell before the Ophthalmic Section of the American Medical Association in 1907, he would have found a reference to the paper of Chester Dewey of Rochester, N. Y., entitled "On an Unnoticed Kind of Abnormal Vision." This paper appeared in the *American Journal of Science and Arts,* in 1849. I quote the following from Dr. Hubbell's work:

"Expressing himself according to the knowledge of that time, he said that there were two well-known kinds of abnormal vision in eyes not diseases, 'the far sighted and the near sighted.' He then adds:

"There is a kind of abnormal vision, different from either of these, which is not farsighted or nearsighted, but

---

(1) Wochenschr. f. Therapie des Auges, April 26, 1908.

in which small near objects, or larger distant objects, are not seen with distinctness. This imperfection occurs in children and young persons and is remedied by *convex* spectacles which are suited to the eyes of persons from 65 to 70 years of age. The *younger* eyes require the *older* glasses and with advancing years *less convex* glasses are required. At the age of 45, or more, this kind of abnormal vision becomes much diminished. As the young use glasses of the farsighted, this kind may be called *neomacropia.* It is evident that convex glasses produce that change in the rays of light which fits such eyes to see distinctly small and large objects at varying distances. This fact proves that there is no defect in the adjusting power of the eyes. The cause, then, is to be sought in the structure of the eye."—ED.]

Over-Correction of Hypermetropia in the Treatment of Asthenopia. Fridenberg[1] recommends in cases of asthenopia which are not at all, or only temporarily, improved by full correction, careful correction of the astigmatism with spherical over-correction by + 1.00, so that vision is reduced from 20/xx to 20/xxx, from 20/xxx to 20/lx. If, after wearing these glasses for a while, the distressing symptoms have disappeared, the over-correction may be diminished or entirely discarded. The reason of the cure is that by this "fogging method" the accommodation which would make vision still worse is involuntarily relaxed and after some time the stimulus to it is suppressed. The asthenopia is generally due to spasm of accommodation and the therapeutic object in all cases of tonic spasms is less to obtain rest and immobilization, as brought about by cycloplegics, than light work by gradually progressing exercise and massage. By over-correction the accommodation for near work is not rendered impossible, as by atropinization, but promoted and made easier. Thus the eye may accomplish a certain amount of near work without effort, the advantages of relaxation of accommodation being obtained without the disadvantages of cycloplegia.

Monocular Correction of Ametropia. Instead of bifocal lenses for presbyopes who have ametropia Percy Dunn[2]

---

(1) Klin. Monatsbl. f. Augenheilk., p. 21, 1908.
(2) The Ophthalmoscope, February, 1908.

sometimes prescribes the ametropic correction for one eye and the ametropic correction plus the presbyopic correction for the other eye. The patient is then enabled to read with one eye and see at a distance with the other. The author claims that these lenses do not cause discomfort nor confusion, as do bifocals.

[However useful the procedure described by Dunn may be in Great Britain I am convinced that it will not do for Americans. When it is impossible or extremely difficult to bring about binocular vision there would seem to be an excuse for the use of one eye only for distance or near work but the disassociation of the two eyes (in other words, the demoralization of binocular vision) is too serious a matter to permit the statement made in this article to pass uncriticised. I hope it will be a long time before the monocle and its congeners become fashionable in this country.—ED.]

Monocular Diplopia. Pollock[1] divides all cases of *monocular diplopia arising from optical conditions* in the anterior segment of the eyeball into two groups—the first with double pupil, and the second where irregular refraction by the cornea and lens produced two or more images on the retina. The first group includes such conditions as a band passing across the pupil, whether congenital in origin or due to inflammatory processes, or to iridodialysis. In these cases diplopia only occurs if the object was out of focus for the eye. Among the second group are a number of varied affections. The lens when dislocated so that the edge passes across the pupil always causes monocular diplopia. Both images are out of focus, the one formed through the margin of the lens is as if myopic, while the other, due to the aphakic condition, resembles hypermetropia. Irregular corneal refraction, from old superficial ulceration, occasionally gives rise to diplopia, but generally of an indefinite character; it is more persistent than some of the other forms. That due to irregular lenticular astigmatism is comparatively rare, except when due to incipient cataract.

The question of the possibility of the retinal origin of monocular diplopia is discussed. Constantin reported a

---

(1) The Lancet, Aug. 8, 1908.

case where diplopia occurred due to detachment of the retina, the entire upper portion of which was applied to the lower half of the retina, the latter still being *in situ* and the light thus affecting two portions of the retina at the same time. Pollock's case was that of a woman with double choked disc. She had diplopia in one eye during the early stage of regression of the edema, and he advanced the theory that the diplopia was due to a shrinkage of the retina, which caused slight wrinkling of the layer of rods and cones at the mucula. Light converging to a focus would then affect two neighboring regions and so produce the diplopia.

Spectacle Frames for Infants. Since spectacles are a regrettable necessity for infants in the treatment of squint, it becomes a problem how to adjust the frames without injuring the delicate tissues of the infant face. Hook temples do not answer, since, if heavy and strong, they produce abrasion, and if frail, they fail to retain the adjustment of the lenses. B. Harman[1] uses the following expedient: A piece of tape, elastic or not, is looped under the nucha, its ends threaded through the eyes of the spectacle bows, then carried on to the vertex, where they are tied together. This circuit of tape holds the spectacles firmly in position, yet allows of sufficient elasticity to avoid pressure on the nose, and the bows are not dragged down on the tops of the ears.

HYGIENE OF THE EYE.

The Harmful Effects of Ultra-Violet Rays on the Human Eye. Investigations carried out by Schanz and Stockhausen[2] show that *ophthalmia electrica is due to ultra-violet rays.* The same disease, though in a less characteristic form, is produced also by many other illuminants containing a large percentage of ultra-violet rays. Snow blindness is similar in its symptoms to electrical ophthalmia, and is likewise produced by ultra-violet rays contained in reflected sunlight. That the action of ultra-violet rays, so far from being confined to the external eye, also affects its deeper parts, is evidenced by the intense fluorescence of the lens which they are able to produce.

---

(1) Brit. Med. Jour., Sept. 12, 1908.
(2) Abstracted from the Popular Science Monthly, Oct. 24, 1908.

As a slight turbidity is produced in the lens by an intense lighting with ultra-violet rays, it may be said that the cataract of old age is possibly due to a progressive alteration of the lens. The spectrum of crude oil lamps and candles hardly exceeds the region of visible rays. The ultra-violet rays, however, extend as soon as a chimney is added and an even more extensive spectrum is produced by using an incandescent mantle; but the longest ultra-violet spectra are found in electric illuminants. In all electric lamps fitted with a glass cover of any kind, the short wave lengths are absorbed by the glass. Protective spectacles afford no protection against ultra-violet rays, and weaken the whole spectrum, for which reason they are not suitable for practical purposes. The authors have undertaken the production of a new kind of protective glass which is now brought on the market under the name of "euphos" glass. This glass, which is of a light greenish-yellow hue, owes its remarkable power of absorbing ultra-violet rays to its special composition rather than to its color. The composition can be adapted to each kind of lamp. With a very slight loss of light (3 to 5 per cent.) this glass screens off entirely any ultra-violet rays. Special experiments made on animals show that it really affords an efficient protection to the eye.

Diseases of the Eye Set up by Ultra-violet Rays from Glaring Sources of Light and Protection Against them by Thin Panes of Colorless Glass. Voght[1] shows how, in high concentration, the *ultra-violet rays* in our modern illuminants are deleterious to the healthy eye, producing conjunctivitis, keratitis, iritis, opacities of the lens and chorio-retinitis, and influence existing diseases of the eye unfavorably. He then discusses the question by what means this deleterious effect of glaring sources of light may be prevented. An ideal protecting glass must fulfill two conditions: 1, ability, in the usual thickness, to absorb all, or at least the greatest portion, of ultra-violet rays; 2, lack of color.

The grayish yellow glass of Fieuzal proved very useful as material for protective cataract spectacles. Its disadvantages consist in diminishing or abolishing the faculty

---

(1) Archiv. f. Augenheilk, p. 161, 1908,

to discriminate between colors and in the conspicuousness of its color. As the admixture of lead in the chemical composition of a glass has been found to increase the power of absorption of ultra-violet rays, Voght made experiments in that direction. Upon his device the factory of Schott and Gen, at Jena, succeeded in producing such a glass. This "Schwerflint 0.198," in thin panes (1 to 2 mm. thick), is almost colorless, in panes 10 mm. thick it is slightly yellow. Careful examinations showed that it absorbs in the thickness of the ordinary lenses (1 to 3 mm.) all ultra-violet rays to a small fraction, and transmits all visible rays except a small fraction of violet and blue.

Voght points out that his glass can not supplant smoked spectacles in diseases of the cornea, iris, etc., with considerable photophobia, as this diminishes the intensity of all kinds of rays. The Schwerflint, however, will prove of great service as material for lamps, to guard the eye against the glaring of electric, Welsbach, acetylene lights, etc., especially in factories, schools and sick rooms, without diminishing the intensity of light.

Spectacles of Schwerflint are also recommended in incipient senile cataract or disposition to it, aphakia, conjunctivitis and keratitis, especially if caused by ultra-violet rays, chorio-retinitis of the macula and other ocular affections which may be produced by ultra-violet rays, then as handy colorless protective glass in mountain tours, against diseases caused by certain vocations, e. g., the cataract of glass blowers, blacksmiths and founders, and against electric ophthalmia.

[Having prescribed quite extensively various shades of yellow and amber-tinted lenses and protectives I am convinced of their extreme value in many forms of photophobia. With *transparent protectors* against the violet and ultra-violet rays I have had no experience.—Ed.]

Railway Accidents and the Color Sense. Stratton[1] points out the *danger of "white" light signals being mistaken for window-lamps,* etc. When green comes dimly to the eye, particularly if coming through smoke, and when sight has grown accustomed to the dark, it does not

---

(1) Pop. Sc. Monthly, March, 1908.

appear green at all, but as a pale and ambiguous light that is indistinguishable from white. More than one instance has occurred where the failure to observe a "distant" or "caution" signal, which is often green, has been a large part of the cause of fatal accidents. But the core of the present system is red. A ruby glass placed before a semaphore lamp, by cutting off the green, blue and violet rays, leaves the light often about one-fifth as intense as when the red glass is removed. Thus, in a cluster of remote signal lights, the white lights usually far outshine the red, the sign of danger. If in the laboratory a "white" semaphore light was reduced in brightness to where in the darkness it could just be perceived, and a railway ruby glass placed before it, the very least increase in brightness at which it could be observed was fourteenfold. Under ordinary conditions an increase of thirtyfold has been necessary before any conscious impression of the light was made through the red glass. A man who had passed the color tests required it to be increased seventy times in order to perceive it. The intensity of light which in some other colors is sufficient to make an impression, does not in red penetrate the mind, yet, all things considered, it may be the best color sign for danger. The spatial character of objects such as shape, position, and especially movement, are more naturally and quickly noted than the color. Although there may be some disadvantages, the writer believes that an effective and safe system of signals might consist of a row of lights,—e. g., imagine incandescent lights inserted in the signal arm used by day, lengthened and otherwise modified. Though a considerable distance be between lights, yet they appear as a continuous line. Experiments show that the main directions of such a line can be caught by the normal eye when the length is about a thousandth of the distance from which it is to be read. Such a system is used in the navy. Two movable arms, each provided with a row of incandescent lights, here rapidly convey, by the direction in which they point, their message from ship to ship, or to the shore. Numerous instances of those defective in color sense having successfully passed the color tests are recorded.

A Magazine for the Blind. A description of the *Zieg-*

ler Magazine for the Blind is given in the *Scientific American* for May 16, 1908. The former periodical has a circulation of about 8,000. The scope of the magazine is very broad. It gives a monthly review of current events, some standard literature, both prose and verse, short stories, a page of music, and a page of conundrums and jokes. Two editions are printed, one in New York point, the other in American Braille. The back cover page of each number of the magazine is illustrated. Usually a map is shown and an illustration of some prominent structure, such as the Brooklyn bridge, or the Statue of Liberty. Blind operatives are employed as far as possible. There are several engravings illustrating various phases of this work for the blind.

Mental and Ocular Overstrain in the Education of Children Carhart,[1] in an article on this subject, gives the following list of suggestions made by the Association of Woman Principals of the Public Schools of New York, with the advice of a number of oculists, to the Board of Education. They might well be borne in mind by adult persons.

"1. That hereafter no calendared or coated paper be permitted in the text-books given to children, as the dazzle of such paper is injurious to their eyes. 2. That half-tone pictures be not permitted in school books, but that simple, easily seen outline pictures be substituted for them. 3. That the length of lines in school books be of a minimum of two and one-half inches to a maximum of three inches, with a space between the lines of not less than 3 mm. 4. That in reading the child be advised to hold his book at an angle of approximately 45 degrees, and that in oral reading they be required to look up frequently. 5. That after a lesson demanding close work the children be asked to look up at the ceiling or out of the window to change the focus of their eyes and rest the muscles of accommodation. 6. That class rooms be equipped with loose chairs of different sizes so that the children may sit in seats that fit them and placed where they can see best. 7. That in the first two years of school all writing be upon blackboards instead of upon paper. 8. That all rooms where

---

(1) Med. Review of Reviews, September, 1908.

artificial light is burned continually be closed; that no part-time classes be permitted to occupy any room in which the light is not entirely satisfactory. 9. All electric light bulbs used in lighting class rooms to be made of frosted glass, and that clusters of such bulbs be provided with pale amber shades to screen the pupils' eyes from the direct rays of the light. These recommendations have not yet been acted upon by the Board of Education of New York City, but they are being carefully considered, and probably will, with modifications, be adopted. If they are put in force in the near future a very great advance will be made in the precautions surrounding school life in New York City, and children's eyes will be in the future much safer from damage than they have been up to the present time.

The Eyes of School Children. The same author,[1] speaking of the *Eyes of School Children,* remarks that the *increase during late years in the number of children wearing glasses* is due not to an increase in the number of weak or diseased eyes, so much as to the greater strain on the function of vision necessitated by our more extended use of the eyes for close work in the complex civilization of the present day.

The normal child is born hypermetropic and without astigmatism. The myopic child is either defective from birth or has acquired myopia from the stress of eyestrain through the "turnstile of astigmatism." Astigmatism is not congenital, but is practically always acquired in the normal child during the early years of life by excessive strain on the muscles of accommodation.

Kindergarten and primary work should be so arranged as to avoid strain on the muscles of accommodation of the eye, in the plastic years of childhood. Hence, sewing and all weaving exercises should be limited in amount, if not absolutely eliminated.

Systematic study should be begun only when the delicate and soft tissues of the child's eyes have attained sufficient formation to resist distortion on moderate use of the accommodation. This means that the prolonged close work should not be allowed until the age of 10 or over.

---

(1) Am. Jour. of Obstetrics, July, 1908.

A child beginning systematic study at that age will, with suitable care, be able at 16 or 18 to acquire all the knowledge possible to its more precocious companion, and will have the inestimable advantages of normal eyes and healthy physique.

No young child should be encouraged to compete with its companions for prizes. Mental and ocular overstrain are the inevitable results of such educational monstrosities. In the primary schools especially there should be no grading of the children.

A child incapable of the prolonged use of the eyes at the proper age should not be classed as culpably lazy. In the majority of cases there will be found uncorrected refractive error.

Inability to concentrate the mental attention and deficient powers of observation are often caused by bad visual memory resulting from eyestrain.

The symptoms and physical signs of eyestrain in children can be easily recognized, and there is no more brilliant success in medicine than that which follows the correction in children of refractive overstrain.

Prophylaxis and Treatment of Blennorrhea Neonatorum. Greeff[1] thinks that *blennorrhea neonatorum is in every case an absolutely curable disease.* Notwithstanding this fact 20 per cent. of all cases of blindness are caused by this disease.

It is important from a prophylactic standpoint to instruct the parents of the nature of this condition and to employ the installation of a drop of silver nitrate into the eyes immediately after birth. Concentrated solutions from 2 to 5 per cent. are too strong; a solution of 1/4 per cent. is sufficient for the purpose.

If there is infection of the eye the local treatment consists in the irrigation of the conjunctiva with a 0.1 per cent. solution of silver nitrate. This mode of treatment is used by the mother or nurse for the first few days every hour or two. The method employed previously, that of touching the conjunctiva with a pledget of cotton, is dangerous on account of the possible injuring or infecting of the cornea.

---

(1) Allgem. Wien. Med. Zeitung, March 24, 1908.

BACTERIOLOGY.

Trachoma. Perhaps the most important ophthalmic work of the year is the *original investigations undertaken by bacteriologists in the etiology of trachoma.* Not only has it been important in establishing to some unknown extent the nature of the disease, but it will probably be useful in the treatment of this widespread and intractable form of infection.

The work of Halberstädter and Prowazek and the associated labors of Greeff, Frosch and Clausen, have shown for the first time a probable cause of trachoma. They have found in the smears from the conjunctival secretion of patients suffering from trachoma, small coccus-like bodies within the epithelial cells usually characteristically clumped together near the nucleus. Halberstädter and Prowazek have obtained these bodies from the conjunctival sac of ourang-outangs that had been previously inoculated with trachoma. The general opinion as to their origin is that they are probably parasites. The work done by E. Herford in Greeff's clinic in the Charits in Berlin, has confirmed the previous work done. Herford also examined preparations which did not show any trachoma bodies and believes that either through the difficulty of staining or the fact that these cases were not really trachomatous, the bodies could not be found. Control preparations were made from normal conjunctivæ and various forms of conjunctivitis. The staining process was the older method of Giemsa, particular care being taken to filter the mixture. Herford gives the details of this technic. Much of the experimentation was made in the so-called trachoma district around Koenigsburg where the material is very plentiful. A colored plate accompanies Herford's article in the *Klinische Monatsblätter für Augenheilkunde,* March, 1909, showing eleven different stained preparations of the trachoma bodies.—Ed.]

Cultivation of the Meningococcus From Eye Conditions Complicating Epidemic Cerebrospinal Meningitis. During the last year McKee[1] saw seven cases of epidemic

---

(1) The Ophthalmic Record, September, 1908.

cerebrospinal meningitis in which ocular complications were present. One was a case of metastatic ophthalmia and six were cases of conjunctivitis. From the pus in the anterior chamber of the hypopion iritis case and from the conjunctiva in two cases of conjunctivitis were cultivated Gram negative diplococci, which were carefully studied and shown to be meningococci. To these cases is to be added the cultivation of the meningococcus once from the normal conjunctival sac. The author lays great stress upon the inaccuracy of basing a diagnosis of the meningococcus upon the presence in smear preparations of Gram negative diplococci. Meningococci can only be positively demonstrated by carefully studying them in cultures on various media.

Staphylococcal Infections of the Eyes and Their Treatment with Vaccine. Mayou[1] reports fourteen cases. Eight were extraocular, and were mostly associated with acne rosacea, styes or boils. The ocular affections were corneal ulcers, phlyctenulæ, conjunctivitis and blepharitis. The intraocular affections were metastatic and postoperative infections. The vaccine used was the mixed staphylococcal vaccine prepared by the Jenner Institute of Preventive Medicine, or a vaccine prepared from the patient's local lesion, after the method of Wright. The opsonic index was watched in most of the cases, but is not deemed absolutely essential. The first dose should not exceed 500 million staphylococci, but may be increased to 2,000 million. In the multiple lesions of the face and eyes, the ocular lesions got well much faster than the face lesions; although the face lesions improved in all cases, some did not get well completely or were only slightly improved. Of the intraocular affections, two cases of metastatic panophthalmitis are reported in which enucleation was performed. In both cases the staphylococcus albus was found in smear preparations of the pus from the eye and in pure culture on the media. These two eyes are not reported to show results of vaccine treatment, but for their etiologic importance. Three cases of metastatic iridocyclitis are reported, in one of which some aqueous was collected, and from this a pure culture was obtained of

---

(1) The Ophthalmoscope, August, 1908.

staphylococcus albus. Complete and rapid recovery took place in these three cases upon vaccine treatment. He speaks of three cases of suppuration following needlings in all of which the staphylococcus albus was found in pure culture.

Spirochæta Pallida in Ocular Lues. In the article by Harris and Corbus, elsewhere referred to, a full description of this organism is given. I quote their account of its life history as follows:

Method of Obtaining the Material. "For chancres, mucous patches and condylomata it is sufficient to clean the lesions thoroughly with warm water. They are then irritated by being rubbed vigorously with a piece of cotton wrapped on a probe. This causes an abundant exudation of serum. A small drop of this is placed on a cover-glass, which is now carefully inverted on the slide as in making a fresh blood preparation. It is well not to have much admixture of blood, as the blood cells interfere somewhat with the observation. For cutaneous lesions one may take a drop of blood from the lesions and often find the organism. The best method, however, is to scarify the lesion down to the papillary layer and then apply a small cupping glass. The abundant exudate of serum usually contains numerous spirochetes.

On looking at a specimen containing serum from a chancre one sees numerous small, round luminous bodies which have a very active Brownian movement. These particles of albumin are probably identical with the blood-dust of Müller. If the cleansing has not been thorough, one often sees various forms of bacteria, the cocci looking like pearls. The leucocytes are seen as a mass of white granules surrounding the dark nucleus, the various forms being easily differentiated. One often sees the ameboid movement and the granules in an active Brownian motion. The red corpuscles show as a luminous ring surrounding a central pale reddish zone.

Characteristic Features of the Spirochetes. The spirochetes are typical, much more so than in the stained specimen, and are exact duplicates of those stained by the Levaditi method. The most characteristic features are:

1. *Size:*—They vary in length from 7 to 21 microns,

being from 1 to 3 times the diameter of a red blood cell. It is not uncommon to see the organism longer than this, but on account of the difference in the motions of the two extremities, we believe these long forms are composed of two or more individuals.

2. *Shape:*—They are seen to consist of an extremely slender thread closely wound in a corkscrew or spring form, the windings being very acute. In the fresh specimen the windings are absolutely regular, but as the specimen gets older the organism changes form, the most frequent change being an obliteration or irregularity of the windings in the central portion. This is a very common appearance in the stained preparations.

3. *The Ends:*—These are sharp and terminate on the periphery of the spiral and not in the center, as the *Spirochæta buccalis* and some of the other forms do. This peculiarity of the ends is only seen when the organism rotates on its long axis.

4. *Motility:*—When the specimen is freshly prepared the organism is very active and possesses the following motions: (a) A rotation on its long axis in either direction; this motion is very rapid but not necessarily accompanied by a change of position; as the specimen gets older this motion grows less. (b) It progresses from place to place but not so rapidly as the other forms of spirochete commonly met. (c) They have a bending or twisting motion which is quite quick and spasmodic. This form of movement increases as the specimen gets old and at times one sees an organism bent in the form of a circle, resembling somewhat a crenated red blood corpuscle. It is not uncommon to find two organisms joined end to end. In fact this arrangement is so common that it lends some weight to the view that the organism multiplies by fission. Again, one sees two or three organisms lying side by side. We have never found the spirochete in a red or white blood corpuscle as described and pictured by some observers in the stained specimen, and we are inclined to believe such appearances are artifacts.

The number of organisms found varies in the different lesions. They are most numerous in chancres, condylomata and mucous patches and vary from two or three in a field to sixty or eighty. Cases that have received some treatment show fewer organisms than the untreated ones. A few days local treatment with calomel or other mercurial preparations causes a marked diminution in the number present in the chancre, although they are very numerous in the enlarged inguinal glands. Among the cutaneous lesions, aside from the condylomata and mucous patches, the ulcerative syphilides show the most organisms. As a general rule, one may say that the more succulent the lesion the more numerous are the organisms.

In several patients having large plaques on the tonsils we found the sputum teeming with the organisms, and in these specimens one can study the differences between the *Spirochœta pallida* and the *S. buccalis* and *S. dentium.* We have never been able to convince ourselves of the presence of cilia or of an undulatory membrane, although there are times when one is suspicious that the latter might be present.

The organism when fresh is very active, but in about three-quarters to one hour after preparing the slide the movements become spasmodic and much less frequent and malformations occur. We have kept the organisms at the room temperature for two weeks or more, but at the end of that time one could not say whether or not they were alive, they certainly were not motile and had not multiplied. In capillary tubes we have had the organisms remain alive and motile for twelve hours at the room temperature.

The *Spirochœtœ pallidœ* as seen by this method, after some experience, are not difficult to differentiate from other organisms. The older the specimen the more difficult it is. The fresh specimen is very typical, and by close study of the size, windings and movements can be differentiated from other forms. The thread is much thinner, the windings more acute and the motility, as to locomotion, less than the other forms met.

We have often seen a very much thinner and shorter body, that seems to have an extremely rapid rotary motion, which gives it the appearance of having a spiral form with knobbed ends. Its bending motion is marked but its locomotion is poor. These bodies vary greatly in size and are very common. As to their identity and significance we are unable to make any statement. We have found them in both syphilitic and non-syphilitic lesions.

The Bacteriologic Aspects of Neurophathic Keratitis. Davis and Hall[1] call attention to the many hypotheses used to explain the cause of neuropathic keratitis, giving an outline with the arguments for and against, taken from Wilbrand and Saenger. These hypotheses include: The purely trophic, the trophic traumatic, the trophic with peripheral irritation, the vasomotor, the vasomotor traumatic, the purely traumatic, the desiccation, and the mycotic.

They then give the results of bacteriologic investigations based on the examinations of 21 clinical cases. All these cases had the Hartley-Krause operation performed for trigeminal neuralgia; 11 of them developed neuropathic keratitis, whilst the other 9, up to the time when they were last seen, showed no affection of the cornea. Sir Victor Horsley undertook, by a series of operations on animals, the investigation of the pathogenic properties of that organism which was found to be constantly present only in the eyes of patients affected with keratitis.

Several different microorganisms were found in all 21 cases; but there was one bacillus (called for the present X bacillus) which was found only in those eyes which showed neuropathic keratitis, resembling the pseudo-diphtheria bacillus, but differentiated by the three following points: the X bacillus shows occasional granule formation, gives no naked-eye growth on potato, and does not render bouillon turbid.

The writer's conclusions are: The bacillus X was found present in 30 per cent. of normal people; it was present in the conjunctival sac of all those patients who had neuropathic keratitis, and among the epithelial cells at the margin of the ulcer of the excised eyes; it was not found in those cases which did not develop keratitis after excision of the Gasserian ganglion. The presence of the bacillus in the sac is, therefore, necessary for the production of neuropathic keratitis, but its presence without an associated lesion of the Gasserian ganglion does not lead to

---

(1) British Med. Jour., Jan. 11, 1908.

keratitis. There is, however, a third factor necessary for the production of keratitis after excision of the Gasserian ganglion, and this is prevented from acting by closure of the lids. For the production of neuropathic keratitis three factors must be present: (1) Removal of the Gasserian ganglion, (2) the presence of the bacillus, (3) a factor of undefined nature dependent on the eyelids and removed by closing them. The first and second are not adequate alone, as suture of the lids prevents or cures neuropathic keratitis; the first and third are not adequate alone, because, as was shown, keratitis only occurs after destructive lesions of the Gasserian ganglion when the organism is present, and in the same proportion of patients as that in which the organism occurs in normal persons.

THE EYELIDS.

The Treatment of Trichiasis. Butler,[1] as a result of a large experience with trichiasis cases at the British Ophthalmic Hospital in Jerusalem, considers the Van Millingen operation the only satisfactory splitting operation. He considers it especially indicated where there is conjunctival atrophy, where the tarsus is short, and in relapses from other operations. The author has never seen a recurrence from Van Millingen's operation.

[During a visit to the British Ophthalmic Hospital in Jerusalem last winter, I had an opportunity of realizing what an enormous amount of operative material passes through its doors in the course of a single year. Probably there are more operations for trichiasis and the other sequels for trachoma, done in this institution than in any other part of the world. It is a pity that want of funds and other considerations prevent this admirable hospital from doing more in the way of relieving the large trachoma population of Palestine. There certainly is an opening for the employment of a few hundred thousand dollars in a much needed charitable undertaking.

For the benefit of those of my readers who have forgotten the technic of the Van Millingen operation I would refer them to page 172 of the first part of Czermak's *Augenärztliche Operationen.* It will be remembered that that operator was in the habit of splitting the intermarginal portion of the lid, drawing the wound margin containing the cilia forward and holding them in place by stitches. As soon as the bleeding stopped he covered the bare wound (generally from 2 to 2½ mm. wide) with mucous membrane from the lip, keeping the graft in proper apposition by means of cotton wool held in place with a bandage. The dressing he advised was iodoform vaseline. The dressing is renewed every 24 hours, the stitches being removed not earlier than 48 hours.

---

(1) Archives of Ophthal., July, 1908.

In this connection I would remind my readers that Harold Gifford has invented a most useful instrument for the easy removal of mucous membrane from the lips and has suggested other improvements in the technic of Van Millingen's operation. I may add that I saw the late Dr. Van Millingen at work during a visit to Constantinople some 12 years ago, he informed me that he believed his procedure to be well fitted for the majority of cases, in which, as is well known, there is much tissue contraction and absorption.—Ed.]

Early Transplantation in Burns of the Lids. Satisfactory healing in these accidents is often frustrated by cicatricial retraction. This is due to the formation of granulation tissue, which has a never ending tendency to shrink. Pfalz[1] advises us to cover the defect, be it ever so small, with Thiersch flaps, immediately after removal of the eschar. In defects of the conjunctiva the flap must be sewed into the upper or lower fornix. It must be done as early as possible, from the fourth to the sixth day after the injury. The remnants of the necrotic tissue must be removed with the sharp spoon. His results were excellent, making later plastic operation unnecessary.

Operation for Cicatricial Ectropion of the Lower Lid. The reason why operations for cicatricial ectropion fail, according to Hotz[2] is because the newly formed lower lid is not anchored to the infraorbital margin. If this is not done the traction from the skin of the cheek again causes

---

(1) Deutsch. med. Woch., p. 823, 1908.
(2) Annals of Ophthalmol., April, 1908.

eversion of the lid. The author prefers to use the cicatricial skin, which usually extends from the everted lid more or less far into the cheek. He cuts a large semilunar flap, which in connection with the lid border is dissected up and mobilized until the lid can be placed in its normal position. The next step is to reduce the overstretched border to the proper length by removing a suitable piece at the outer canthus. This done, the margin of the lid flap is fastened by numerous fine sutures to the tarso-orbital fascia just above the infraorbital margin. Finally the lid margin is drawn up as far as possible and held in this position by two ligatures fastened to the forehead by plaster strips. The wound area below the lid is covered by a separate Thiersch flap cut from the skin of the arm. If cicatricial skin is not available, and Wolff or Thiersch flaps are used, two flaps must be used, one for the lid and one for the cheek, and the lid flap sutured to the lid border above and to the tarso-orbital fascia below.

Palpebral Autoplasty. Pedunculated Flaps Taken from the Cervical Region (of Snydacker) and Autoplasty in Two Periods with Utilization of the Transplanted Flap. In Snydacker's operation a flap is taken from the skin of the cervical region parallel to the sternocleidomastoid and with its base just below the ear. The free end is sutured in the bared space on the lid and brow, while the ridge between it and the base lies upon the skin of the cheek. After the flap has united this bridge is cut away.

When the loss of substance is too extensive to be replaced in this way, Morax[1] instead of cutting away the bridge, frees only its base and, after scraping the granulations from its lower surface and freshening its margins, uses it to form an additional flap.

Operations for Ptosis. Fergus[2] divides these into several classes: 1. Those which, like the procedures of Drausart, Pegenstecher and Hess, depend upon the production of cicatricial contraction. 2. Procedures which leave ligatures permanently embedded in the tissues, as in the operations of Mules, Worth and Harman. 3. Attempts at the advancement of the occipitofrontalis, or attaching the

---

(1) Annals d'Oculistique, January, 1908.
(2) British Med. Jour., May 16, 1908.

superior rectus to the upper lip; others have advanced what they believe to be the levator palpebræ superioris. 4. Plastic operations, such as that described by Panas. Fergus greatly objects to the unsurgical method of those operations which depend upon cicatricial contraction with sutures, for unless they become septic they are useless. He prefers the advancement operations. Recently he has had marked success by a new method, which consists of shortening, rather than excision, of a large portion of the tarsus. A portion of skin and tarsus was removed between two incisions in the lid, and the strong fibrous tissue which comes down from the occipitofrontalis was attached to the portion of the tarsus remaining with absorbent sutures. The skin was then closed with superficial sutures. Several cases have been treated with this method with excellent results.

Observations on the Motais Operation for Ptosis After describing this operation Shoemaker[1] recommends suturing the tongue from the superior rectus into the upper edge of the tarsus through a skin wound made down to the tarsus through the upper lid. He believes that this skin wound is not only not objectionable but that it makes it possible to attach the tongue to the tarsus in the proper manner, which cannot be done through a conjunctival wound. He arrives at this conclusion after operating upon three cases after the method of Motais.

THE CONJUNCTIVA.

The Fluid in the Healthy and Diseased Conjunctival Sac There is, according to Schirmer,[2] a greater production of fluid in the conjunctival sac than there is lost by evaporation. In a normal individual when he is awake 0.5-0.75 gm. of tears are produced in 16 hours, of which 0.27 gms. evaporate; 0.003 gms. of tears are pressed through the tear duct into the nose. During sleep the lacrimal gland does not secrete, and the circulation through the lacrimal duct ceases. After extirpation of both lacrimal glands the conjunctiva does not become dry, because the

---

(1) Annals of Ophthalmol., October, 1907.
(2) Wien. med. Woch., May 16, 1908.

conjunctiva itself produces as much fluid as it loses by evaporation. The eye thus remains in just as moist a condition as normally, and only during crying does the one eye become drier than the other.

Lacrimation in facial paralysis can be explained by the fact that the Horner's portion of the orbicularis cannot contract; nictitation and with this aspiration through the lacrimal sac ceases, and the tears are not led into the nose.

Conjunctivitis.

Purulent Conjunctivitis in an Infant Delivered by Cesarean Section. There is a general impression that ophthalmia neonatorum is always due to vaginal infection, and that this is nearly always gonococcic. Druais, on the contrary, as the result of an extensive study of the subject, asserts that not more than half of the conjunctivitis of the new born is of gonococcic origin, and Terson[1] says that his own experience confirms this view. Since various microbes may cause the disease, blennorrhea should not be always charged against the parents. Cases of purulent ophthalmia in the new born occur in spite of the most thorough vaginal disinfection by the most careful accoucheurs. The disease can only be reduced to a minimum by the most rigid prophylaxis. The conjunctivitis, too, may occur before the infant is born. Children have been born with the cornea perforated or even with the ball emptied by corneal sloughing from intrauterine conjunctivitis.

The case reported is that of a child delivered by Cesarean section. As soon as its head appeared in the uterine incision those present noticed that its eyes were red, swollen and full of secretion The author took charge of it as soon as possible and found it to be a case of very intense bilateral purulent conjunctivitis. Microscopic examination of the pus showed both diplococci and staphylococci.

Parinaud's Conjunctivitis. F. Schoeler[2] reports that so far 48 cases of Parinaud's conjunctivitis have been published. He observed the disease in the left eye of a girl eighteen months old, with swelling of the parotid and the

---

(1) Annales d'Oculistique, July, 1907.
(2) Deutsch. med. Woch., p. 331, 1908.

glands behind the ear and of the neck, without suppuration. The conjunctival changes consisted in granulations, yellowish nodules, erosions of the epithelium and indurations of the lids, chiefly the lower one. The moderate secretion was serous, with shreds, cornea intact. There was general malaise with rise of temperature. The possibility of infection through animals could not be excluded, but was scarcely probable.

Morax-Axenfeld Conjunctivitis, says Hanford McKee,[1] was first described as a chronic catarrhal form which, from the associated blepharitis, was sometimes called *blepharo-conjunctivitis,* or from the reddening at the outer and inner canthi, *angular conjunctivitis,* so that a characteristic clinical picture was attributed to this infection as follows: Both eyes involved, beginning as a slight catarrhal conjunctivitis it increases in severity and in 24 to 48 hours there will be seen marked reddening of the lids, especially at the outer and inner canthi; some maceration of the skin and in the conjunctival sac a varied amount of watery discharge which gives the reddened lids a moist appearance. The blepharitis and the reddening at the outer and inner canthi make the picture a marked one. This is the appearance of the classical type first described, but Morax-Axenfeld conjunctivitis may be seen in any of the following forms:

1. A mild catarrhal conjunctivitis, where the patient complains of pain in the eyes, especially when reading at night.
2. A form of catarrhal conjunctivitis with some slight reddening at the outer and inner canthi (angular conjunctivitis).
3. A catarrhal conjunctivitis with accompanying blepharitis (blepharo-conjunctivitis).
4. Acute purulent conjunctivitis.

In many cases Morax-Axenfeld shows the characteristic clinical picture of a mild catarrhal conjunctivitis, with reddening at the outer and inner canthi, and in these cases a temporary diagnosis may be made from the clinical signs. But it is to be remembered that many cases showing a like clinical picture will present themselves where

---

(1) Ophthalmology, April, 1908.

the etiologic factor is not a bacteriologic one. No disease of the conjunctiva presents at times such a typical clinical picture as does this form, but at other times the clinical picture will give you no indication that the infection is a diplo-bacillary one.

"In many cases of blepharitis your bacteriologic examination will give you entirely negative results. Indeed, I feel much more like advising a thorough refractive examination in all cases of blepharitis and eczema of the lid than I do a bacteriologic one, and I believe the results from the examination of the refraction will be more satisfactory. I have seen case after case of blepharitis and eczema of the lids where thorough bacteriologic examination gave negative results. Persistent cases, now slightly improved, now worse, when the errors of refraction were corrected then only were satisfactory results obtained.

"The diplobacillus of Morax-Axenfeld is frequently found in the noses of patients suffering from this form of conjunctivitis. I have examined many cases and demonstrated the presence of diplobacilli in the nose. When we consider how chronic this form of conjunctivitis is and how full of diplobacilli we find the tears in the conjunctival sac, does it seem extraordinary that they should be carried into the nose?"

The complication most liable to occur is a serious one—ulceration of the cornea. It is now known that the Morax-Axenfeld diplobacillus can give rise to ulceration of the cornea as severe in type as the ulcus serpens of pneumococcus infection. It is, luckily, however, not a common complication. Among the 300 cases in 11 only was ulceration of the cornea seen.

Weigeln has lately reported a purulent keratitis complicating a case of Morax-Axenfeld conjunctivitis in an infant of two months.

The treatment, *par excellence,* in Morax-Axenfeld conjunctivitis is frequent irrigations of the conjunctival sac with a weak solution of the sulphate of zinc. Thorough irrigation with the instillation of drops of gr. ½ to the ounce, three or four times daily, will give exceedingly satisfactory results. "I have treated cases with argyrol and silver nitrate to no purpose. In no case of Morax-Axenfeld conjunctivitis where the patient has followed the directions have I seen the sulphate of zinc fail. I have seen cases return, especially children, with no improvement, but here the failure was due to the inability to instil the drops. For this reason I always make it a point with these cases which return unimproved to thoroughly irrigate the sac myself.

"Where diplobacillary conjunctivitis is found associated with trachoma I would advise treatment of the trachoma with silver nitrate, or whatever measure is thought best. Such cases treated only with nitrate of silver will not make satisfactory progress until zinc sulphate solution has been added to the treatment."

In using the various solutions of the sulphate of zinc dropped into the eyes night and morning, Kelly found that in using the gr. i. to the ounce solution the diplobacilli were present six weeks later; with a solution of grs. iv. to the ounce after three weeks diplobacilli could not be found, while with the solution of grs. viii. to the ounce the average duration of the presence of the organism was 13.5 days.

Silva, in Axenfeld's clinic, could not prove a diffusion of the sulphate of zinc through the cornea, and showed, as we have found clinically, that zinc checks the bacilli but does not kill them.

We have, then, in Morax-Axenfeld conjunctivitis an exceedingly common affection of the conjunctiva, a form which varies so in its clinical picture from mild catarrhal to acute purulent conjunctivitis that a diagnosis must be made from bacteriologic methods. It is a form of conjunctivitis that is exceedingly chronic, but will be found to react surely and well to its specific, the sulphate of zinc.

Etiology and Treatment of Chronic Conjunctivitis. Elsching[1] refers especially to two forms of chronic conjunctivitis, the first being *conjunctivitis Meibomiana,* which is produced by the hypersecretion of the Meibomian glands.

In the slight form of this variety, the transitory fold and bulbar conjunctiva do not become affected, and only

---

(1) Wien. klin. Woch, Aug. 13, 1908.

the palpebral conjunctiva is diseased; the upper and lower lids become thickened, the lid margins red, the palpebral conjunctiva thick and velvety, and diffusely reddened. There are often to be seen through the thickened conjunctiva, Meibomian glands filled with yellow secretion; an intense amount of thin pus can be emptied by employing pressure. Sometimes diplobacilli are found in this secretion.

This variety of chronic conjunctivitis can be cured by a thorough evacuation of the Meibomian glands by expressing them every day or every week, according to intensity of the affection, and the use of astringents.

This condition of the conjunctiva is mostly to be found in persons above 40 years of age.

The second variety of chronic conjunctivitis, which is not so well known, is produced either by an absolute or relative insufficiency of the lids. In slight closure of the lids the margins of the lids do not approximate completely; this is readily observed when the patient is asleep. In these cases the bulbar conjunctiva near the lower corneal margin is dry, thickened, scaly and sometimes sclerotic. These eyes must be protected overnight with a bandage; a 2 to 4 per cent. borolanolin ointment is to be applied every night to the lower conjunctival sac.

Vernal Conjunctivitis With Corneal Changes. Posey[1] reports the case of a young colored woman who had suffered from vernal conjunctivitis since childhood. Her cornea gradually became involved until vision was reduced to 1/lx in the right and 2/lx in the left eye. The corneæ were surrounded by a slightly elevated zone of yellowish white tissue and their transparency destroyed throughout by irregular opacities, which seemed to be made up of a hyaline degeneration of reduplicated epithelial and subepithelial elements. The center of each cornea appeared to be avascular but numerous small vessels extended over the limbus from the surrounding conjunctiva. The treatment used was massage of the cornea with ointments of increasing strengths of yellow oxid of mercury and dionin. Pilocarpin, 1/2 gr. to the ounce, was used twice daily. The eyes were also steamed several times daily with hot

---

(1) Annals of Ophthalmol., October, 1907.

vapor. Under this treatment the ocular condition gradually improved, the corneæ became less injected and the eyes quiet, with vision of 5/lx.

Phlyctenular Conjunctivitis Associated with Diplo-Bacillary Conjunctivitis. Six cases of phlyctenular conjunctivitis associated with the presence of large quantities of diplo-bacilli have been observed by Hanford McKee.[1] They all got well promptly under the use of zinc. He does not claim that the phlyctenules were caused by diplo-bacillary infection, but where these bacteria are found the cases respond favorably to zinc.

TRACHOMA.

Origin of Trachoma. Greeff[2] (see also under Bacteriology, of this volume) calls attention to the fact that during the past ten years no advance has been made in the clinical aspect of trachoma, and he believes that we will not obtain any additional light on this disease until its cause is known. The author has devoted the last ten years to a scientific investigation of trachoma and has concluded that *with our present methods* the organism of trachoma can not be demonstrated.

Frosch and Clausen, in an examination of a large number of trachoma cases found small diplo-bacteria present in the discharge and in the follicle contents. They successfully inoculated the human conjunctiva with material from trachomatous eyes. Inoculation of rabbits, guinea-pigs and dogs was negative, but the authors successfully inoculated anthropomorphic apes, producing a purulent conjunctivitis without the presence of trachoma follicles.

Treatment of Trachoma. Egbert[3] mentions the various methods of treating trachoma, and deprecates the employment of the most common one—sulphate of copper. He alludes to the use of 1-500 bichlorid of mercury rubbed into the conjunctiva as more or less satisfactory, but he believes that the manipulation and not the medication is the important factor in the procedure, since he has obtained

---

(1) Ophthalmic Record, March, 1908.
(2) Archives of Ophthal., p. 406, 1908.
(2) N. Y. Med., Jour., March 21, 1908.

good results from massage of the tissue of the lids with a smooth glass spatula.

Previous to this treatment, however, most cases require operation for the opening and emptying of all granules and the removal of hyperplastic material. For accomplishing this he uses a sharp and blunt curette so constructed that all portions of the conjunctiva can be reached with little danger of injuring smooth, healthy tissue. When done thoroughly the operation will seldom require repetition, though stimulation through rubbing with the blunt instrument is frequently called for at intervals to promote resolution in the diseased area. This rubbing and massage may often, however, be advantageously carried out by means of the glass spatula.

Jequirity in Trachoma. Gillman[1] advocates the use of jequirity in the treatment of trachoma, and, in selected cases, believes that it gives better results than any other method of treatment for trachoma. He states that the typical cases calling for the use of jequirity are eyes partially or completely blind from pannus or vascular keratitis following or complicating trachomatous granulations on the palpebral conjunctiva. The author also uses it in chronic cases without corneal involvement which do not improve under milder remedies. He starts treatment with the infusion, 2 per cent. solution, and later uses the powder if the case requires it. He cites clinical cases illustrating the rapid and satisfactory improvement following its use.

A. E. Prince[2] has had excellent results with a ½ *per cent. solution of copper sulphate in glycerin to be used frequently by the patient at home,* and gradually increased in strength to the limit of toleration. Two other favorite remedies are glycerole of tannin, 4 per cent., and yellow oxid of mercury, 1½ per cent., which are almost universally tolerated. Silver nitrate once a day, ½ per cent., is excellent in the presence of mucopurulent secretion. The operation of expression with scarification and milking out the follicles, is necessary in a large proportion of cases. Ten per cent. copper sulphate in glycerin is then scrubbed into the lids with cotton. After-treatment is of paramount im-

---

(1) Jour. Ophthalmol. and Oto-Laryngol., March, 1908.
(2) Jour. Am. Med. Assoc., April 25, 1908.

portance, and too much reliance should not be placed on the mere operation. Jequirity, which was generally abandoned after having been taken up with undue enthusiasm and used promiscuously, is recommended for cautious use in selected cases. The infusion should be made from freshly prepared powder, the beans being deprived of the cortex by grinding in a hand pepper-mill and a solution of not more than ¼ per cent. used at first. This may gradually be increased to ½ per cent. or 1 per cent. at most. *Excision of the tarsus* is of value in case of deformity, cysts, irregular cicatrization or marked roughness, trachomatous foci in the depths, or granular deposits which cause recurrent inflammation.

[Excision of the tarsus, which operation I have found very useful in some 50 inveterate cases of trachoma, has its justification in the probable fact that the infection is no longer in or at least confined to the conjunctiva, but has its principal seat in the submucous tissues and especially in the body of the tarsus. I am pleased to note that MacCallon is extensively employing this procedure in the treatment of old cases of granular ophthalmia in the Egyptian hospitals and outdoor dispensaries.—Ed.]

BOSTON

THE CORNEA.

The Pathology of Rupture of the Membrane of Descemet. Coats[1] describes the various forms which rupture of Descemet's membrane may take and the subsequent changes which they undergo, giving the results of his observations in cases of infantile glaucoma, myopia and conical cornea. He furnishes a historical account of rupture of the membrane of Descemet from the first anatomical description of this condition as given by Becker in 1875. He then gives his personal observations based on the study of 13 cases of buphthalmos, 8 of glioma with increased tension, and 4 of myopia of high degree. Ruptures were found in all cases of buphthalmos except one. In 8 cases of glioma they were present twice, while he failed to find any in uncomplicated myopia, but found them in 1 case

---

(1) Trans. Oph. Soc. U. K., Vol. 27.

of myopia associated with glaucoma. The author attributes their absence in high myopia to the fact that in myopia it is the posterior hemisphere of the globe that stretches and not the anterior. Coats states that in microscopic preparations the fissures are more numerous and extensive in the periphery of the cornea where the stretching and thinning is greatest in buphthalmos. In the author's cases the endothelium was always intact over the gap, and he believes that the preservation of the transparency of the cornea is due to that fact. He mentions a rare form of rupture in which overlapping of the edges occurs instead of spreading apart, due to a relaxation of the heightened intraocular tension after the occurrence of the rupture. The subsequent changes consist of processes of repair by the deposition of new membranes, or masses of similar substance, from the endothelium, and this occurs in an imperfect manner.

The author gives the essential cause of rupture of Descemet's membrane as stretching of the cornea, and states that the term "elastic" as applied to it is a misnomer and that it is inferior in elasticity to the corneal lamellæ, as evidenced by the fact that when divided it assumes curly and spiral forms instead of retaining its original form.

Notes are given on clinical cases, the article is illustrated and a bibliography is appended.

[It must not be forgotten that these clefts are generally seen with ease, both by direct and indirect illumination. Three years ago the Editor published in the *Ophthalmic Record* an illustrated account of a case in point.]

KERATITIS.

Diffuse Interstitial Keratitis in Acquired Syphilis. A. E. Davis[1] reports a number of cases of this rare condition. Salmon patch is very exceptional. The course is generally quieter and milder than in inherited specific disease, but occasionally sight is entirely lost. In some cases reported there was inherited, as well as acquired, syphilis, the keratitis probably being due to the former. Herbert Fischer believes the affection to be a tertiary manifesta-

---

(1) Jour. Am. Med. Assoc., July 25, 1908.

tion, that it seems usually to attack only one eye, the infiltration generally limiting itself to a portion of the cornea only. The clinical appearance is the same as the type found in inherited syphilis. The average time of development is about 10 years after primary lesion. Stephenson, Nuel and many others consider this affection secondary to anterior uveitis, and that the unilateral character is due to early treatment. Neglected cases become bilateral. The disease has been produced experimentally in rabbits and monkeys by inoculating the cornea with scrapings from human chancres containing the spirochæte. Some cases are undoubtedly tubercular, yet they cannot be distinguished from the specific variety, clinically or pathologically. In the discussion attention was called to the complication with mild plastic iritis, the rapid course in inherited syphilis, the presence of acquired syphilis in the very young where it may be mistaken for the inherited form, the tendency for the keratitis to assume a sclerosing form, the slight tendency to vascularization, the possibility of confirming the diagnosis by finding the spirochæte, and the question of Calmette's reaction.

Some Etiologic Factors in Interstitial Keratitis. Risley, Sr.,[1] believes that inherited syphilis is responsible for a large majority of the cases of interstitial keratitis, but we should bear in mind that a considerable group of affections which may be designated diseases of nutrition are frequently responsible for this form of corneal disease. Where inherited syphilis can be traced in the second and third generations it is often only one of the incidental manifestations of the faulty general metabolism. Two very interesting cases are reported, both of which had a very profound interstitial keratitis without specific history, or other specific manifestations. The general conditions were more those of myxedema; general torpor of mind and body; skin appearance of old ivory; general dropsical appearance, but with hardness of the flesh, without pitting, and no albuminuria; stubby clubbed fingers and stunted growth; dry skin, thick dry lips, swollen tongue and palate. No improvement in the ocular or physical condition was manifested until the administration was

---

(1) Ophthalmic Record, July, 1908.

begun of the dried pulv. thyroid gland of the sheep, gr. iii, t. i. d. The local corneal improvement was astonishing, as was also the physical improvement. Recovery took place in each case, but in one there was some years later an attack of interstitial keratitis in the fellow eye which was not involved in the first attack. It occurred under quite different physical conditions, and the administration of the thyroid did no good. He recovered, however, under mercurial treatment.

The Treatment of Interstitial Keratitis. Martin,[1] as the result of clinical observations in his own practice and that of 30 colleagues, concludes that local measures, such as subconjunctival injections, massage, hot or cold applications, dionin, yellow salve, electricity, except for the alleviation of symptoms and complications, are of no value during the stage of infiltration and vascularization, while iodids are positively harmful. The treatment is the treatment of congenital syphilis, relief of local symptoms, and complicating uveal inflammation, and measures for the more rapid clearing of corneal opacities. Mercury is the drug par excellence and is best administered by inunction in doses sufficient to saturate the system and keep the patient on the verge of salivation. The dark-room is unnecessary and dangerous. On the contrary, the patient should have full outdoor liberty, with suitable protection from light. Milk and egg diet, stimulants in case of marked debility, and a generally strengthening regime are of importance.

For the relief of pain and inflammation, hot applications, leeching and atropin are of use, but not as effective as in acute inflammations. Yellow salve, calomel powder, subconjunctival salt injections are used for the opacities, but these generally clear up best with vigorous constitutional treatment. In the discussion of this paper attention was called to the value of dionin in strong solution or even powder form, the good results obtained from mixed treatment, the danger of pushing mercurials in debilitated patients; the clinical observation of stubborn interstitial keratitis cut short by an attack of measles.

[My experience in the treatment of this very chronic

---

(1) Jour. Am. Med. Assoc., April 11, 1908.

and stubborn disease with all its complications tallies with that of Dr. Martin except in the use of mercurials. These I have found in most instances do more harm than good—to act as impediments rather than a help. My reliance is chiefly on general tonics, an outdoor life, rest and good feeding.—ED.]

Thyroid Extract in Keratitis. Two cases of interstitial keratitis are reported by Radcliffe.[1] One was a young man aged 23, and the other a boy of 11, both eyes being involved in each case. The usual methods of treatment resulted in no improvement after several months' trial. The patients were then placed upon *thyroid extract* internally and a 3 per cent. solution of this drug instilled in the eyes 3 times daily. The results of this treatment were prompt and very striking, complete clearing of the cornea taking place. The thyroid extract was given in 5 grain doses 3 times daily. The author believes that doses of from 1 to 2 grains will be equally effective.

HERPES.

Treatment of Febrile Herpes of the Cornea. Ammann[2] recommends slight cauterization of the herpes configurations in their whole extent, point for point, with the galvanocautery. The galvanocautery must be minimally red glowing, so that the remaining maculæ be not noticeably denser than otherwise after longer lasting herpes. Ammann had excellent results in 11 cases which are reported. The prompt action of the glavanocautery would suggest the bacteriologic nature of herpes.

ULCERS.

Corneal Ulcers. Frantz[3] believes that in every case of ulcer of the cornea, the associated local or constitutional pathologic conditions should be sought out and treated. Pilocarpin sweats and the salicylates exert a beneficial effect upon nearly every type. Copper sulphate is not to be used on trachoma granules when an ulcer is present, and sugar of lead is contraindicated in the presence of corneal

---

(1) The Ophthalmoscope, September, 1908.
(2) Archiv f. Augenheilk., p. 194, 1908.
(3) Iowa Med. Jour., Dec. 15, 1907.

abrasion. When tincture of iodin is used as a cautery, calomel should not be used, whether on the cornea, or internally. When using strong solutions of nitrate of silver, cocain should not be applied locally. Dionin was a disappointment, as far as clearing opacities is concerned, but a 5 per cent. solution of benzoate of lithium acts as a solvent for carbonate and phosphate of calcium which most opacities contain.

ZONULAR OPACITY.

Zonular Opacity of the Cornea. Heath[1] discusses the condition variously described as *calcareous film, band opacity* (Graefe), or *ribbon-shaped keratitis.* It may be primary or occur in eyes blind from glaucoma or iridocyclitis. The opacities are punctiform and crowded together, forming a gray stripe across the cornea, occupying the exposed portion of the lid fissure. The disease progresses slowly. Sooner or later both eyes are involved. In some cases there are attacks of severe pain, but ulceration is never observed. Most cases were in men over 45. The pathologic basis of the condition is a hyaline degeneration of corneal cells that later become calcareous. Gout, renal disorders, loss of vital energy in the cornea through vascular changes, repeated irritation of the surface of the eye, as by foreign bodies, are etiologic factors. Graefe noted a resemblance to glaucoma and bad effects of atropin. Sight has been improved by scraping the cornea and by iridectomy. Carbonate of soda, nitric acid, hydrochloric acid, 5 per cent., have been recommended. In Heath's case, scraping and applications of weak carbonate of soda solutions were of no avail. Iridectomy resulted in vision of 15/lx, where the patient had been unable to get about alone.

PANNUS.

Treatment of Pannus by Inoculating the Eye with Gonorrheal Pus. Goldzieher[2] comments on the unsatisfactory results usually obtained in the treatment of pannus crassus. He gives the history of the employment of jequirity and of gonorrheal secretion for this purpose. He

---

(1) Jour. Am. Med. Assoc., July 18, 1908.
(2) Med. Presse, Feb. 26, 1908.

narrates the history of one case of this sort, in which the results were surprisingly good, and in conclusion states: "From this case and two others previously treated on similar lines, I can draw the conclusion that the long-discontinued Jaeger inoculation of blennorrhea can be applied as an *ultimatum refugium.* It is by no means more dangerous than a jequirity-caused ophthalmia. The conclusive indication for its application is the presence of pannus crassus. It is worthy of special mention that after the disappearance of the inoculated blennorrhea not only has the cornea cleared up but—in opposition to the results arrived at with jequiritol—the conjunctival tract has also regained its soundness.

[The introduction of jequiritol and our improved technic in the use of jequirity itself, do not seem to warrant this (as most of us believe to be) most dangerous procedure. It will require a number of additional observations before the ancient and rejected method of employing gonorrheal pus can be justified.—Ed.]

KERECTOMY.

A Modified Crichett's Operation of Kerectomy. In 1863 Crichett, on removal of the anterior portion of the eye, closed the wound with sutures passed through the sclerotic. The objections were that by passing the needle through the ciliary body hemorrhages and even sympathetic ophthalmia may follow. Borghetti[1] uses the same procedure in the first and second step of his operation as in the DeWecker operation. The steps are as follows: (a) Detach the conjunctiva from the sclerotic all round, and as far back to the extent of 1 centimeter. (b) Pass a suture all round the conjunctiva close to its margin. (c) A second purse-suture is placed a few mm. behind the corneal margin, including the episcleral tissue as well as the superficial fibers of the sclerotic, the suture being a buried one all round except at the lower part of the eyeball, where the two ends of the thread should pierce the conjunctiva and rest on the external side of this membrane.

---

(1) Of Wellington, New Zealand.

(d) By pulling upon the two ends of the thread the eye is fixed, and by means of a cataract knife a flap is cut upward, equal in size to four-fifths of the tissue to be removed. (e) As this goes on, the two ends of the suture are pulled upon more and more, so that no sooner has the knife accomplished the cut upward than the wound is closed and the loosened flap, still adhering to the lower part of the eyeball, is ready to be snipped off level by a stroke of the scissors. (f) The conjunctiva is next brought in front of the eye as in DeWecker's operation. (g) The suture holding the sclerotic is loosened to prevent the ciliary nerves suffering compression, and the two ends of the thread are knotted.

The following advantages are claimed for this operation:

1. The ciliary nerves suffer no pressure and there is no fear of sympathetic ophthalmia.
2. This method can be applied where other methods cannot, and even when chloroform is contraindicated, or when intelligent assistance is not easily found.
3. An artificial eye can be placed on the stump which moves freely in all directions.

KERATOPLASTY.

Keratoplasty. Lesser[1] reports an example of *transplantation of the cornea of a rabbit* to the human eye with retention of a certain degree of transparency; von Hippel's trephine was used and the operation performed in the usual manner; before operation there was a dense leucoma and vision was reduced to perception of light; 3 months after the operation the graft was in perfect apposition and the patient could count fingers at 12 inches.

[As Fuchs long ago pointed out, opacification of the transplanted cornea is the normal result of the von Hippel operation and this alteration of tissue generally occurs within a few weeks or months after even a successful grafting. In common with several other operators I have had a case in which the transplanted cornea remained clear for nearly a year.—ED.]

---

(1) Medical Record, Sept. 12, 1908.

DISEASES OF THE LENS. - CATARACT.

Mittendorf's Lens-Spots. Since Mittendorf's second article in 1906, Gifford[1] has made a record of the cases he has seen showing the spot on the posterior capsule just to the nasal side of its center. In approximately 1,500 cases he found the spot on one or both eyes of 31 patients, or about 2 per cent. In 4 cases they occurred in both eyes, and in those in which only one eye was affected 12 showed it in the right eye, and 15 in the left. The author agrees with Mittendorf that they are caused by remnants of the hyaloid artery.

Congenital Cataract. Treacher-Collins[2] advises us to wait until the child is 10 months old before operating. At an earlier age the cornea is so small and the anterior chamber so shallow that the necessary instrumentation cannot be so satisfactorily carried out as in a more fully developed eye. Moreover, the amount of aqueous humor is so small that it does not suffice for solution of the liberated lens substance.

In some cases in which the pupil is small and does not dilate well with atropin it is best to commence with an iridectomy.

In nearly all cases it is well to begin with a needling, for valuable information can be obtained by this means as to the thickness of the capsule and consistency of the lens, even should it fail to liberate much lens matter to the action of the aqueous.

If the cataract is a dense, white, anterior polar one, set in a ring of clear, or partially clear, lens substance and apparently flattened from before backward, the so-called disc-shaped cataract, then an attempt should be made to separate the central white opacity with a needle and let it fall into the anterior chamber. Two needles are sometimes required to effect this.

If, on pricking the capsule, milky-white fluid escapes into the anterior chamber (congenital Morgagnian cataract),

---

(1) Ophthalmic Record, March, 1908.
(2) The Ophthalmoscope, September, 1908.

it is well at once to evacuate this fluid, for fear of increased tension ensuing.

In some cases of congenital cataract, the whole lens and capsule can be removed in a most satisfactory way by forceps. Very often, however, such a procedure is followed by escape of vitreous. It is difficult to differentiate which cataracts can be safely dealt with in this manner. They generally seem to be complete cataracts with a tough capsule and lens matter of a gelatinous consistency.

If after a needling and some absorptions of liberated lens matter, a dense, tough, white, fibrous-looking membrane remains, there is probably some atypical development of the anterior part of the vitreous. Under such circumstances an attempt had best be made forcibly to displace the membrane downward and backward out of the axis of vision.

The Effect of Potassium Iodid on Incipient Cataract. Pflugk[1] gives the following as a summary of his findings:

In rabbits the epithelial cells of the lens capsule overlying the interior sectorial lines differ in their anatomical structure as well as in their physiologic function from the surrounding epithelium.

With the aid of the palladium chlorid reaction it is possible in rabbits, cats, dogs, guinea-pigs and frogs to determine the route of entrance into the lens of subconjunctival injections of solutions of salt. The reaction appears earliest and most markedly in the line of the anterior sectorial lines of the lens in the form of a sharp blackish streak. Later as the result of the penetration of the K. I. through osmosis it affects uniformly the anterior surface of the lens.

The first changes in the epithelium of the lens capsule takes place in naphthalinated rabbits in from 1½ to 2 hours after the administration of the emulsion. These changes are most pronounced over the sectorial lines.

By the simultaneous injection of weak solutions of K. I. these changes in epithelium of the rabbit's lens could be postponed several hours.

By the administration of the K. I. solution for several days a decided limitation of the growth of the capsular

---

(1) Graefe's Archiv. f. Ophthal., February, 1908.

epithelium in the naphthalin lens of the rabbit could be observed.

The acknowledged parallelism between naphthalin cataract of rabbits and human senile cataract makes it probable that the improvement of vision following the administration of preparations of K. I. (collyria, baths, subconjunctival injections) which has been observed by a long list of writers (Badel, Dufour, Boisseuil, Dransart, Lafon, v. Pflugk) is the result of action upon the epithelium of the lens and its surroundings by the penetration of the K. I.

Reports of clearing up of well observed lenticular opacities are to be found in literature in large numbers in records free from criticism. Inasmuch as the possibility of clearing up of lenticular opacities with an accompanying improvement in vision is demonstrated, the doubt cast on the correctness of the observations of Badal and his pupils is not warranted.

A résume of the published clinical histories of cases of incipient cataract in man treated by the iodid method shows that of the 239 eyes thus treated in a large number a very great improvement in vision occurred.

The length of observations in which the opacity was controlled in isolated cases of Badal was 5 years and in the 30 published cases of the author it was of varying length—as long as 4 years.

As the entire harmlessness of the treatment of Badal has been confirmed by an unusually large number of observed cases, the treatment of incipient cataract by the potassium iodid method is urged.

A review of the cases treated by the iodid method shows that a much greater improvement is to be obtained in the visual power by the subconjunctival injection than by instillations and baths of equal strength solutions.

By the use of the author's method of anesthetizing the conjunctiva and the employment of acoin as an addition to the fluid to be injected as well as its use after the injection it is possible to render the subconjunctival injection of potassium iodid completely painless.

Badal employs as a collyrium a solution of K. I. (0.25 to 10.0) and as an eye bath (7.5 to 300.0) the latter in a gradually increasing concentration. While Badal gave up the subconjunctival method the author has found it by far the most efficacious and painless if employed as above directed in a 1 per cent. strength.

In very incipient cases 3 drops of a solution of 0.25 to 10.0 is instilled into the eye twice daily. More advanced cases are treated by eye baths of increasing concentration, 7.5 to 300 to 20 to 300, twice daily in an eye-cup 2 to 5 minutes. The solution is to be warm. As a guide to its employment the author says that after the visual acuity is improved the treatment must be kept up at least one month. If then, after a period of nontreatment, the opacity seems to have come to a standstill, the treatment is, after about 3 months, renewed in a milder form for a period of several weeks. If, in spite of this treatment, the opacities increase, the subconjunctival injections are employed.

Operations for the Artificial Maturation of the Immature Senile Cataract. A brief description of the *various methods of artificially ripening immature senile cataract* is given by Pooley.[1] 1, Simple discission of the anterior capsule; 2, discission combined with iridectomy; 3, discission and external massage; 4, iridectomy and external massage; 5, iridectomy and internal massage; 6, simple paracentesis with internal massage; 7, simple paracentesis with direct massage; 8, Jocq's injection, by the Pravaz syringe, of fluid beneath the anterior capsule; 9, a method recently practiced by Claiborne, a modification of Mooren's.

The operation is considered to be contraindicated in the following forms of cataract: Slowly sclerosing lenses with few striæ, posterior polar cataract, and slowly forming cataract in myopic eyes, as well as all those cases where there is any indication of luxation of the lens, as shown by tremulous iris. And it is further suggested that before any ripening procedure is undertaken we should be sure that the tension is normal and the pupil dilatable.

The writer concludes that if one considers the uncertainty of success in bringing about complete opacity of the lens by the methods enumerated, *the probable thickening of the capsule which may result therefrom, thus rendering the success of the subsequent extraction less favorable in*

---

(1) N. Y. Med. Jour., Dec. 14, 1907.

securing good vision [italics mine.—ED.], together with the dangers and complications which may ensue, and still further, that "a good many operators are no longer possessed of the fear, which they so long entertained, of operating upon immature cataracts, we shall feel like falling in with the wise conclusion made by Knapp when he says, 'many operators, the present writer included, prefer the risks of removing an immature cataract to any ripening operation.' "

Major H. Smith[1] notes that a great drawback in the capsulotomy operation for extraction is the *impossibility of removing all the soft cortex of an immature cataract.* The result is iritis and a dense after-cataract requiring extraction. Needling is insufficient, and couching is invariably followed by degeneration of the retina. Slowly ripening cataract subjects the patient to a long period of inactivity and loss of earning power. Of the various methods advised for maturation, puncture of the lens capsule is liable to be a complete failure. Rapid swelling may cause acute glaucoma. Lens masses may escape into the anterior chamber and set up iridocyclitis. Extraction under these conditions may be imperative, but it is hurried, the conditions are unfavorable and the results far from satisfactory. Iridectomy has no influence on ripening. Combined with massage through the cornea, within safe limits, i. e., not sufficient to risk dislocation of the lens, it is also unreliable. The combination with direct massage is "a daring and a most unsafe procedure." Rupture of the capsule or dislocation of the lens may follow manipulations by even the most careful and expert operator. The ripening procedures are all either dangerous or disappointing, and we had better wait for the cataract to become mature or extract the immature cataract in the capsule, "a procedure for which it is admirably suited." In fact, even the normal lens can be extracted as easily as the ripe one by those skilled in the art, as in case of dense leukoma of the cornea with adherent iris. The operation of extraction in the capsule should be performed as soon as vision is so far reduced as to incapacitate the patient for his usual occupation.

---

(1) The Lancet, Aug. 15, 1908.

Adrenalin with Cocain in Cataract Extraction. C. H. Herbert[1] believes that adrenalin increases the action of the cocain and renders bloodless the making of a large conjunctival flap. It causes an increased dilitation of the pupil, which should be counteracted by the use of eserin after the operation. Saline solutions should be instilled during the operation to prevent undue drying of the cornea.

[After several years' employment of adrenalin, adrin, suprarenalin and similar agents in combination with cocain, eucaine and other local anesthetics, I do not find that the considerations set forth by Herbert are of extreme value in ophthalmic surgery. It is quite true that through their employment the operative field is rendered clear in most cases, but the reaction often does more harm than the primary influence does good.

Except in those operative procedures where a bloodless area is of unusual value for two or three minutes, I no longer employ adrenalin. I am, however, free to confess that most of my colleagues with whom I have discussed this matter continue to use this combination of styptic and local anesthetic, especially in squint and other bloody operations about the eye.—ED.]

Extraction of Cataract in the Capsule. Arnold Knapp[2] gives the results of his observations on the extraction of cataract in the capsule as observed on a recent visit to Maj. Henry Smith in Jullunder, India. About 3,000 extractions were done at the Jullunder General Hospital during the past year, 50 extractions often being done in a single morning. Knapp witnessed 104 extractions, and states that nearly all of these were done without iridectomy. The early closure of the wound was noticeable. The result was a black pupil, freedom from iritic irritation and adhesions. Partial prolapse of the iris and incarceration was observed in 17 cases. Escape of vitreous in 3; slight escape of vitreous in 10; suppuration in 2; hemorrhage (subchoiroidal) 1. The writer refers to the advantages that follow this method of operating, but adds that "the difficulty of properly replacing the iris, owing to the greater

---

(1) The Ophthalmoscope, March, 1908.
(2) Archives of Ophthalmol., January, 1908.

chance of prolapse of vitreous, with the possibility of subsequent inflammatory dangers from incarceration, may be a fault of the method."

Statistics of Cataract Operations. From 1896 to 1907, 5,057 eye operations were performed in Schöler's (Berlin) clinic,[1] of which 1,322 were for cataract, viz., 798 senile, 19 diabetic, 93 traumatic, 48 complicated, 42 soft congenital, 123 zonular, 199 secondary. Flap extraction upward, mostly with iridectomy, 75 without. Simple extraction was considered indicated in relatively young persons, of whom quiet behavior after the operation may be expected, to give them the greatest possible amount of vision. Sublimate was used as antiseptic, and cocain, 5 per cent., as anesthetic in all cases of senile cataract. Prolapse of vitreous occurred in 38. In such cases the speculum was removed after expulsion of the lens without maneuvers for reposition, the palpebral fissure dusted with xeroform, which with the tears gives a very firm closure of the eye, and the single turn of the bandage sewed together. Weber's loop was used in 12 cases, in 4 of these the dislocated lens was extracted within the capsule. If possible, the patient remained in bed for 3 days. The other eye was not bandaged after the second day; the eye operated on after 2 weeks. Discissions for secondary cataract were made in 88 cases, i. e., in a proportion of 1 to 9, not earlier than three weeks after extraction, and always vertically to the lines of greatest tension, which must be carefully ascertained with the magnifying glass. There were 16 (2 per cent.) failures, 13 from purulent infection with panophthalmitis, 3 from iridocyclitis with subsequent phthisis. Seven patients died suddenly after the operation while still at the clinic. Preparatory iridectomy was performed in 29 cases, viz., 4 for artificial ripening, 7 for seclusion and occlusion of the pupil, 6 in anophthalmus of the other eye, 8 for glaucoma, 2 in purulent affections of the tear duct, 1 in diabetic retinitis, 1 in granulosis. The operation in 19 cases of diabetes was the same as usual, in 3 of them only fingers could be counted on account of diabetic retinitis.

In 13 out of 93 cases of traumatic cataract perfect vision was obtained; in 6 exenteration was performed, which

---

(1) Archiv f. Augenheilk., p. 198, 1908.

is preferred to enucleation in infected injuries and panophthalmitis.

One hundred twenty-three cases of zonular cataract were operated upon, 50 bilateral, in 1 sitting. Only in 8 cases discissions, respectively extractions, were performed. In most cases optic iridectomy is preferred, i. e., if by atropin vision is improved, as the preservation of accommodation is of paramount value to the patient, while the changing of near and distance glasses or bifocals is inconvenient. In almost all cases in which extraction had been performed on one eye, iridectomy on the other, the patients preferred the vision of the latter, even if the vision of the aphakic was equal or better. The authors consider this as proof that iridectomy is the better method, and say that it cannot be recommended often enough to the blessing and contentedness of the patients. If, however, the opacities of the lens reach to the periphery and atropin does not improve the sight, discission or extraction is indicated.

One Hundred Consecutive Cases of Cataract Extraction. J. L. Duncan[1] furnishes the *results obtained* in a series of 100 extractions and discusses the best incision; simple and combined extraction; preliminary iridectomy and irrigation of the anterior chamber. In his series of cases the author employed 2 forms of corneal incision. He prefers the incision entirely in the periphery of the cornea except in cases where there are dangers of infection or where the vitality of the cornea is impaired, in which cases he makes a conjunctival flap incision He does the combined extraction and believes the simple extraction subjects the patient to unnecessary risks. His objections to the simple extraction are greater risks of iris prolapse, greater difficulty in removing cortical matter, and greater chances of secondary glaucoma.

Duncan advocates preliminary iridectomy in all cases where there is a rigid iris, a tendency to rheumatism and glaucoma or with an immature cataract. He believes that iritis is less likely to develop and that there is less annoyance from iris hemorrhage, but advocates an iridectomy immediately preceding the capsulotomy in all cases where there are decided senile changes, when there is a possibility

---

(1) **Archives of Ophthalmology, May, 1908.**

of infection, or when there is a chronic bronchitis or nasal catarrh. The author uses irrigation of the anterior chamber as a routine measure.

Collapse of the Sclerotic During Cataract Extraction. Collapse of the sclera without loss of vitreous during the operation of cataract extraction is an accident not mentioned in the majority of recent works. Terrien, in his Surgery of the Eye, gives a short note of 2 cases. Le Roux, in a recent number of *La Clinique Ophthal.,* gives the report of a case and Sirieys[1] details 2 cases in his paper, in both of which, just after completing the incision, the sclera was found to be collapsed, so that it was impossible to extract the lens by the ordinary pressure maneuver. In both cases the loop was passed behind the cataract and delivered. There was in neither case any loss of vitreous, and both patients made a good recovery with useful vision.

Effect of Pressure on the Healing of the Corneal Incision After Cataract Extraction. Edward Jackson[2] calls attention to the fact that in the normal eye the sclerocorneal coat is distended by the intraocular pressure, and that the corneal section for cataract extraction reduces this intraocular tension to zero. The relations which the 2 lips of the wound take to each other in healing are determined during this period. The incisions usually practiced cut the sclerocorneal coat more or less obliquely. Since the intraocular pressure after extraction is zero, the external pressure must be excessive; even the weight of the lids resting passively upon the eyeball forces together the oblique lips of the wound and produces overriding of the anterior or upper lip.

The important, practical deduction from this theoretical consideration of the relation of the lips of the cataract incision is that *pressure upon the eyeball should be carefully avoided after cataract extraction.* Even harmful pressure cannot secure, or greatly assist, fixation of the eyeball. But very moderate pressure can be harmful by causing such displacement of the flap as will interfere with smooth healing. Fixation of the eye and rest of the parts are favored by closure of the fellow eye and guarding

---

(1) La Clinique Ophtal., Feb. 10, 1908.
(2) Ophthalmic Review, November, 1907.

against startling the patient by sudden noises. A dressing in light contact with the lids keeps them closed and favors quiet of the eye by reflex influence. But the bandage, which cannot retain its position unless it makes some pressure, should be discarded after cataract extraction.

[For many years I have been in the habit of using a simple triangular bandage which does not at all press upon the eyeball. I have never been able to understand what possible good can be secured by a pressure bandage of any sort in cataract extraction. Most patients, it is true, feel more comfortable if there is slight but even pressure upon the exterior of the lids, but the use of a bandage with the idea of securing fixation of the eye is, to my mind, not feasible. I quite agree with Jackson in his conclusions and believe that we should avoid the extremes of no protection at all to the eye and too heavy or too much bandage.—ED.]

Propulsive Hemorrhage After Extraction. Blok[1] first saw a patient after her family physician had treated her for glaucoma with atropin. The left eye had been operated on 20 years previously for glaucoma and her vision was 5/xv after correction; the media were clear, a small excavation of the disc and a small typical narrowing of the field were present. Tension normal. Eserin and a broad iridectomy had the usual good results in the right eye. After clearing of the cornea the retina showed many hemorrhages, which slowly disappeared; a typical excavation remained. Six days after the operation the wound opened again without any apparent cause; little pain in and around the eye, radiating to the nose, pointed to a recurrence of the glaucoma. However, the eye became quiet, but vision was reduced to motions of the hand eccentrically to the temporal side.

The patient came back with a cataract in each eye, which had progressed so far in 2 years that she wished to be operated upon. Urine normal; cornea normal; little arteriosclerosis. She was now 75 years old. Previously eserin was instilled, and before the operation 1 per cent. cocain with adrenalin 3 times. Tension was and remained

---

(1) Abstract in Ophthalmology, from the Tydschr. v. Gen., Jan. 26, 1907.

normal; but directly after a normal section the cataractous lens presented itself and came out simultaneously, followed by vitreous. Direct removal of the speculum could not prevent the escape of the entirely normal vitreous, so that the eye was closed with a compressive bandage. Patient complained of great pain in and around the eye, the bandage was colored red and patient vomited. Ice was used over the eye and in the mouth. Pulse was tense, quite fast and slightly irregular. After an hour the pain disappeared, the bleeding stopped and the pulse slowly became normal. Four hours later changing the bandage a big coagulum mixed with vitreous body protruded from the corneal wound. This being removed the wound closed. The bulb was then still full of blood. Tension not raised. The eye became atrophic, with total loss of vision.

Three weeks later, during the night, the patient became oppressed, coughed and expectorated a great deal of bright red blood. This was repeated five days later. The cause of these two hemoptyses was evidently the same as of the propulsive hemorrhage, i. e., rupture of arteries under the influence of increased heart action and increased arterial pressure. The increased heart action during the operation was probably due to nervous influence, perhaps anxiety as regards pain. It is not clear if the adrenalin had any influence for good or evil. However, Blok thinks it is better in such cases not to use it. The strong vessel tonus caused by adrenalin may favor the bursting of brittle vessel walls under existing or provoked higher arterial tension.

[I have a similar experience to relate. After a perfectly successful and uneventful extraction of cataract in a woman, aged 65, the patient was attacked during the following night with violent attacks of coughing and sneezing, followed by vomiting. There did not seem to be any reason for this outbreak except that the patient remembered having had a similar attack some years before. In spite of all efforts on the part of the nurses and house surgeon to stop the emesis the attack continued and was followed by complete extrusion of vitreous through the sclerocorneal wound. Toward morning bleeding set in and the eye was totally lost. I cannot see what influence adrenalin could have in the case detailed by Blok, nor how the bursting of brittle, intraocular vessels can be avoided unless the violence of the coughing, sneezing or vomiting can be limited.—Ed.]

The Inconvenience of Too Close Confinement of the Patient After Cataract Operation. Roune[1] has observed in a number of cataract patients, a few days after operation, general symptoms suggesting gastric disturbance, such as furred tongue, sour breath and anorexia. This state is usually accompanied by ocular symptoms; congestion of the conjunctiva, contraction of the pupil and a tendency to the formation of synechiæ. The patients affected in this way were all decidedly arthritic.

The condition did not yield to rational treatment, but the symptoms disappeared in a few hours, when the patients were allowed to get up. He thinks, therefore, that there must be another factor than digestive troubles to account for this autointoxication. The patients who presented these symptoms most decidedly were those who, from fear of making any movement, subjected themselves to an exaggerated immobility, and then were usually pronounced arthritic subjects, who have special need of exercise and in whom absolute rest favors the production of toxins.

Experience has shown that it is unnecessary to impose upon a cataract patient a prolonged repose, and the author allows his patients to get up in 24 or 48 hours, and uncovers the other eye the day after the operation.

Opecification of the Cornea After Cataract Extraction. Hulen[2] reports a case of striped keratitis going on to general opacification, which could not have been due to any of the usual causes, as use of bichlorid of mercury, traumatism during operation, or bad general condition of the patient. The other eye had been operated on by combined extraction years before and showed a similar condition, the line of section being completely white and opaque, and the cornea rather thinly but entirely opaque with patches of greater density. The condition is extremely rare, treatment is of no avail, and its causes are unknown. Where the condition has followed extraction in one eye it might be well

---

(1) Annales d'Oculistique, March, 1907.
(2) Jour. Am. Med. Assoc., July 25, 1908.

to consider the danger of a similar operation on its fellow and have recourse to some other method, such as couching.

Operations for Secondary Cataract. The possible *complications of operations for secondary cataract* as infection, loss of vitreous, secondary glaucoma, incarceration of the membrane of the secondary cataract, traction on the ciliary body and iris and hemorrhages, dangers of general narcosis, are all set forth by Weill,[1] who asserts that they may be avoided or greatly reduced by his method with the two harpoon needles of Stilling. Weill performed it 130 times within the last few years and saw Stilling perform it 30 times. Infection, or loss of vitreous, never occurred, once secondary glaucoma and once an irrelevant hemorrhage from the iris. The method is described in detail and Weill says that the weak point of it, viz., that the hook of the needle may become entangled in the cornea in pulling it out, can easily be overcome by practice on the test drum.

THE UVEAL TRACT.

IRITIS.

Gonorrheal Iritis. Beaumont[2] believes this condition to be much commoner than is generally supposed, while iritis in acute rheumatism is quite rare. In rheumatoid arthritis the connection is less clear, and it is an open question whether the relation is one of cause and effect or of simple coincidence. Gonorrheal iritis may complicate an acute attack of urethritis, but is more frequently a sequela, and may not come on until years after the original infection. Attacks of synovitis or of other forms of arthritis frequently accompany the ocular inflammation.

Mackenzie was well acquainted with the disease, and noted the frequent association of iritis with synovitis, after exposure to cold, or overexertion of the eyes, even without a fresh attack of urethritis. Generally one eye only is affected and may suffer repeatedly. The other eye may become inflamed later, and the attacks alternate be-

---

(1) Zeitschr. f. Augenheilk., p. 126, 1908.
(2) Brit. Med. Journal, July 18, 1908.

tween the two. Rarely are both eyes inflamed at once. The long interval usually elapsing between the initial urethral infection and the onset of iritis, as well as the fact that these secondary symptoms, or more properly metastases or gonorrhea, are exceptional and hence unexpected, causes the true cause to be overlooked. The iritis may come on years after the urethral attack. Higgens and Griffiths believe the iris becomes on occasions an excretory organ, and tries to eliminate the poison, receiving considerable damage in the effort. The chronic, attenuated virus does not seem to be strong enough to set up inflammation in the "acclimated" or immunized urogenital tract. There must also be a personal element of idiosyncrasy in those who suffer, as the proportion of persons who have iritis to those who have had gonorrhea is very small indeed.

Mikulicz Disease with Tuberculous Iritis. Krailscheimer[1] reports a case in the person of a merchant's apprentice of healthy parents. He had 9 brothers and sisters living and healthy. The 3 eldest died in early childhood of children's diseases. Three years ago the patient suffered from pneumonia, but otherwise he has been well. The present trouble has been insidious. It began with dryness of the mouth and eyes and inflammation of the throat. Ten weeks later there was bilateral iridocyclitis, accompanied (in the right eye) by descemetitis. Beside the enlargement of the lacrimal the parotid and both submaxillary and sublingual glands the left Blandin-Nuhn gland (upon the under surface of the tip of the tongue) was palpable. The palatine glands were not enlarged. The glands in the neck, axilla and groin and at the elbow were enlarged. The spleen could not be palpated. Pulse 140. Heart boundaries normal. There was involvement of the lungs. Urine and blood normal. The left eye quieted under treatment, but the right later developed nodules in the iris, one at the pupillary border, the other at the angle of the anterior chamber.

Microscopic study of the axillary glands showed interstitial inflammation with numerous tubercles and giant cells in the stroma and in the lobes of the glands. Injections of tuberculin (old) were positive.

---

(1) Die Ophthal. klinik, Aug. 5, 1908.

Here we have Mikulicz's disease associated with tuberculous iritis and tuberculous glands, but whether the former was caused by the latter or the lymphadenoid disease predisposed to tuberculous infection cannot with certainty be declared.

Tuberculosis of the Iris Diagnosed and treated by Tuberculin. Allesandro[1] reports the case of a young woman who consulted him Feb. 20, 1906. There was then in the right eye pericorneal redness and photophobia; iris infiltrated and not responsive to light; V-5/lx. Atropin exposed posterior synechiæ. Patient did not return for a month, when several iritic nodules were discovered. To eliminate the possibility of syphilis, active antispecific remedies were tried, but without benefit. The nodules increased in size and became agglutinated. The parents rejecting operative measures, Allesandro began injections of Koch's tuberculin, and later the T. R. This treatment was carried on for some time with intermissions. On June 10, 1906, the tuberculous mass had completely disappeared.

Paracentesis of the Anterior Chamber in Inflammatory Processes of the Uveal Tract. During the past 3 years Denig[2] has opened the anterior chamber at the limbus with a small keratome and allowed the aqueous to escape in 10 cases. Four were cases of interstitial keratitis, 3 of iritis, 2 of chorioretinitis with vitreous opacities, 1 of postoperative cyclitis, and 1 of diabetic neuroretinitis. The operation was followed in most cases by an improvement in the symptoms.

HEMORRHAGES.

Venesection in Relapsing Intraocular Hemorrhages. Kyrieleis[3] reports a case in which the left eye of a healthy full blooded man, aged 19, without any other affections, especially of the circulatory apparatus, had gradually become totally blind from relapsing intraocular hemorrhages and the right eye seemed to be doomed to the same fate. Kyrieleis resorted to 5 venesections at intervals of from

---

(1) La Clinique Ophtal., Feb. 25, 1908.
(2) Ophthalmic Record, March, 1908.
(3) Klin. Monatsbl. f. Augenheilk, p. 513, 1908.

8 to 10 days, drawing about 250 grams of blood each time, kept the patient in bed and gave him iodid of potassium. No new hemorrhage occurred within the next 7 years. R. V. rose to 1/x and everything remained well for a year, when the patient returned with V= fingers at 1 m. after a sudden obstruction had set in, in consequence of a flat detachment of the right retina downward and inward. Although there was no recent hemorrhage, a venesection was performed and the patient was treated with pressure bandage, injections of salt solutions, cauterization of the sclera, according to Dor, and atropin. The retina was reattached after 15 weeks, and fingers were counted at 2.5 m. A bluish gray membrane was seen in the posterior portion of the vitreous, coursing horizontally over the disc and spreading as bands into the vitreous. At the surface of the membrane blood vessels could be discerned with + 10.00. The vitreous of the blind left eye was filled with gray masses and the whole retina was detached. The patient presented himself at intervals. Under iodid of potassium the bands became smaller.

Seven years later the vitreous was dotted with fine opacities, and a blood-red triangle could be seen, most likely a new hemorrhage. Although this caused no visual impairment, a venesection was made at once, drawing 250 grams of blood, and a few days later the red triangle was partly absorbed.

Kyrieleis assumes a frail condition and permeability of the walls of the blood vessels and ascribes the hemorrhages to increased blood pressure from fluctuations at the time of puberty or menopause. Excepting cases of extreme anemia, hemophilia and senile cachexia, he recommends venesection in relapsing ocular hemorrhages, and, if not successful, as a last refuge the ligature of the common carotid.

Kyrieleis thinks venesection has 2 advantages over ligature; under aseptic precautions it is a perfectly harmless procedure and it may be repeated without damage as often as required. Venesection decreases the tension in the vascular system, but must be combined with long continued rest in bed and non-irritating diet in order to exclude increased heart's action, and iodin internally.

THE LACRIMAL APPARATUS.

Dacryocystitis in the Newborn. Ollendorff[1] calls attention to the fact that owing to its *widely different etiology from the same affection in adults,* dacryocystitis in the newborn calls for entirely different treatment. It is almost universally conceded that in the newborn the trouble consists in a congenital atresia of the inferior end of the lacrimonasal duct.

[Edward Jackson, before the date of this article, also drew attention to the differences between lacrimonasal obstruction in the adult and a similar condition in the newborn. Several other observers had already discovered the fact that the majority of the latter get well with the simplest treatment and, it might be added, with no treatment at all. When we consider the heroic efforts detailed in the older text-books and in many periodicals, of both surgeon and mother to treat infants by the same means laid down for the conduct of similar operations in adult life, one regrets that the pathology of this condition was not at that time better understood.—ED.]

Excision of the Lacrimal Sac. Ullrich states the experience in this operation of the Prague Clinic with a report of 183 cases. Here the operation was done most often for ulcus serpens. It seems that over 3,500,000 marks were paid for damages, due to serpent ulcer, by German employers in the past 13 years; since extirpation has been in vogue this has materially decreased. Primary healing followed in 90 per cent. of the cases.

This operation is always done under local anesthesia to avoid hemorrhage, which obscures the field of operation. A 1 per cent. solution of cocain in a Pravaz syringe, to which adrenalin has been added, is injected in the following manner. The needle is inserted over the anterior lacrimal crest and directed upward and slightly inward subcutaneously for about one-third of an inch, and a few drops of the solution injected. The syringe is withdrawn and the needle is again pushed to the bone just below the

---

(1) Die Oph. Klinik, Jan. 20, 1907.

middle part of the canthal ligament and is directed downward, and the second third of the anesthetic mixture used, thus cocainizing the lower part of the sac. The same procedure follows, above the ligament, the needle being directed slightly upward, the part is gently massaged for a couple of minutes and then the operation may be begun, for when properly administered nearly complete anesthesia results.

With a scalpel the first incision is made, cutting only through the skin, from a point above the middle part of the canthal ligament and running downward and slightly outward over the crest. This bony prominence forms the chief landmark during the operation and its location must be constantly borne in mind. The edges of the skin wound are now slightly undermined and a Mueller speculum inserted to hold them apart. The floor of the opening is formed of the delicate superficial fascia, and this is easily divided with the point of a pair of scissors. A toothed thumb forceps and light scissors curved on the flat are now taken up by the operator and the muscle fibers of the orbicularis separated easily by blunt dissection, as these fibers follow the line of the incision. During this period an assistant keeps the field of operation free from blood, using forceps and a strip of gauze for tamponading. The opening is now quite deep in many cases, and below the tough, deep fascia can be plainly made out. Just over the crista a snip is made into this fascia with the point of the scissors, and then inserting one blade into the opening a straight incision can be continued up to the canthal ligament. This ligament may now be severed to enlarge the field, but when done earlier there is a tendency toward hemorrhage from the large veins lying just above. Between the edges of the split fascia lies the pink sac. The fascia is grasped in the forceps to the outer side, and with closed scissors the wall of the sac is gently dissected away from the orbital fascia, taking care to avoid penetrating this, lest a hernia of fat should obscure the view and even lead to a subsequent cellulitis. The nasal edge of the fascia is then fixed and with the scissors the inner wall of the sac is freed from the periosteum of the lacrimal bone. The canaliculi are divided close to the sac and the under surface is easily freed by the blunt dissection close to the bone. The assistant now retracts the upper angle of the wound by means of a small sharp double hook. The body of the sac is firmly grasped with the forceps and the vault dissected loose with a few cuts of the scissors, keeping close to the bone, and now only the connection with the lacrimal duct remains. With the sac between the blade, the scissors inserted into the duct and the cut made as low down as possible.

The sac comes away and a sound is passed through it to determine whether it is intact or not. In most cases a gratifying result is realized. A large Bowman sound is passed into the duct through the wound opening and this followed by a sharp curette with which the entire diseased mucous membrane is extirpated. The cavity is washed with 1-1000 bichlorid and dried with gauze. The skin margins are made tense by traction upon sharp hooks in each angle and three silk sutures bring the edges together, good apposition being most desirable, for in such a case the scar is never visible. A piece of gauze with vaselin is laid above, and a small roll of iodoform gauze is used to exert pressure over the area, thus obliterating any of the dead spaces. A compression bandage and the patient goes home to return in 2 days, provided there are no symptoms. Sutures are removed on the third day, a little dusting powder, preferably xeroform, and the case is completed. Uninterrupted recovery in a week.

Major Elliott[1] gives the following indications for this operation, based on 310 cases: Dilatation of the sac; purulence of the sac contents; evidence of previous attacks of phlegmonous dacryocystitis with the presence of stricture; a history of long-standing obstruction, combined with an inability or unwillingness on the part of the patient to submit to a long course of the probe treatment; or with a timidity that renders it unlikely that such treatment will be persevered in; the presence of any indication for an operation on the globe of the eye (especially cataract); the presence of a septic ulcer in the eye of the same side; any factor, occupational or otherwise, which increases the liability of the patient to eye injury; (not a few of cases,

---

(1) Ophthalmic Review, February, 1908.

in Madras, of septic ulcer of the cornea occur amongst fitters, goldsmiths and stone-masons; in all of the above, and many allied trades, tiny chips of hard substances frequently fly up and injure the cornea); the existence of double lacrimal obstruction, with evidence of past or present mischief in one cornea.

He describes the steps of the operation in full.

After removing the sac, as large a probe as possible (Nos. 9 to 12 Theobald) is thrust down the nasal duct till stopped by the palate, pushing any mucous membrane in front of it, then followed by a red-hot spindle-shaped cautery, to insure the destruction of this membrane. The removed sac is examined under water, and the cavity carefully inspected to make sure that no part has been left behind; if any portions have been so left they are dissected out; if necessary, the neighborhood of the dome of the wound is cauterized freely with a ball-shaped red-hot cautery. The case is dressed on the seventh day, when the stitches are removed.

Discussing the difficulties and complications met with during the operation, the writer advises that the terminal branch of the facial artery be avoided in the first incision, since such division would cause troublesome hemorrhage. When the lacrimal sac is not dilated or distended, it is not uncommonly bound down into the lacrimal groove by a dense fascia, which appears to be a backward reflection from the tendo palpebrarum. When the bridge of the nose is high, and the orbits deep-set, the operator may be embarrassed and burrow outward into the orbit, mistaking a lobule of fat for the sac; such an accident need never happen if the wound is held well open, all hemorrhage stopped, the nasal margin of the lacrimal groove well defined with the finger, and the dense fascia cleanly divided as close to this bony edge as possible; the sac is at once seen lying within its sheath of bone and fascia. Hemorrhage may be dealt with by firm pressure, aided, if need be, by a touch with a pointed cautery over any bleeding spot; if from the nasal duct after the passage of the probe, it may be controlled by plugging, and, after cleaning and drying, by rapidly passing a spindle-shaped cautery down the passage. When one desires to perform a cataract extraction or other serious operation on the globe of the eye, and the lacrimal passages are found (as tested by dropping fluorescein into the conjunctival sac and examining a handkerchief into which the patient has strongly blown his nose) to be closed, even though there may be no very obvious retention, the writer thinks that it is better to remove the sac before undertaking the more serious intraocular operation. He does not consider the use of paraffin to define the limits of the sac necessary; if the cavity does not look clean, or there is doubt as to the thoroughness of the operation, it is best to assume that the sac has not been entirely removed, to inspect thoroughly, and to remove boldly any suspicious part. Of a large number of cases it was deemed necessary to operate a second time on account of a portion of the sac wall having been left behind, in only one instance.

Regarding the complications met with after the operation he enumerates the following: (1) Recurrence of retention, due to a portion of the sac wall having been left behind at the operation; (2) failure to obtain primary union of the wound, or breaking down of the wound after primary union appeared to have been established; (3) progress of the septic ulceration of the cornea for which the operation was undertaken; (4) a chronic catarrhal condition of the lower lid, which is difficult to treat, but which yields eventually to patient treatment along the ordinary lines; it is better not to be too active.

The average time consumed in operation was 12 minutes, the shortest 4½ minutes, the longest 50 minutes. In 71 per cent. of the cases the sac was removed entire.

The writer discusses the question: What becomes of the excessive lacrimal secretion after removal of the sac? It is to be borne in mind that the nervous supply of the gland, of the passages, and of the intermediate irrigated region (the cornea and the conjunctiva) is from one and the same source; it is therefore only natural to suppose that if we remove a source of constant irritation in the shape of inflamed passages we rid the whole lacrimal system of the previously existing irritation and excitation. Whether this explanation be right or wrong, one thing at least is certain, viz., that the extirpation of the sac is practically invariably followed by an immediate diminution of lacrimal secretion; in a large number of cases, as has been seen, this happy result appears to be permanent.

OPTIC NERVE AND RETINA.

Hysterical and Simulated Blindness. A *diagnosis of hysterical blindness* may, according to Howard Hansell,[1] be made when accompanied by certain hysterical stigmata, such as ciliary spasm or paresis; amblyopia due to anesthesia of the retina, corresponding in kind to the anesthesia of the skin; contraction of the visual field; relatively greater for white than for colors, and reversal of the fields for blue and red; the tubular field, blepharospasm, monocular diplopia, anesthesia of the conjunctiva and ring scotoma. Simulated blindness is usually not difficult and is to be detected by testing the pupillary reaction, the stereoscopic tests, the use of red and green letters, etc. These patients always have some very good reason for malingering.

Mirror Writing. A boy seven and a half years of age was seen on account of a peculiar tendency to write reversed letters and figures. His vision was poor on account of hyperopic astigmatism. When he began to learn writing he was given a copy and began at the top of the right-hand corner of the page and wrote with his left hand toward the top left corner. The letters were reversed. The tendency was combated by the care of the teachers, and soon the boy was able to write with either hand. Still he had a tendency to reverse his letters, and it was only by constant watchfulness that he kept from doing it. Specimens of mirror writing submitted to him were read off easily, and he saw nothing peculiar about them. Cases are referred to by Buchanan[2] which have been reported by others, as well as the theories advanced in explanation. It is more frequently seen in left-handed children. There are many well authenticated instances of individuals who have suffered from right hemiplegia (lesion on left side of brain)

---

(1) Annals of Ophthalmol., October, 1907.
(2) Ophthalmoscope, March, 1908.

who have learned to write with left hand and have had a distinct tendency to write mirror-wise.

Differential Diagnosis of Affections of the Optic Nerve. The importance of carefully considering not only the ophthalmoscopic appearance of the nerve-head but the functions of the nerve as tested for acuity of central and peripheral vision and color perception, is noted by Friedenwald.[1] Changes during the progress of the disease as well as the connection of these data with the previous history and habits of the patient, and with such other ocular constitutional, organic, and especially nervous diseases as may be discovered, should also be considered. Descending neuritis with the picture of choked disc is generally due to brain tumor. It is bi-lateral except in rare cases of tumor in the middle fossa. There is at first little or no visual disturbance, and central vision is unimpaired, and the enlargement of the blind spot is easily overlooked. Complete transient obstruction of vision is, however, a frequent and characteristic symptom. Atrophy develops late, causing rapid and marked loss of sight. Other causes are cerebral abscess, serous meningitis, hydrocephalus, nephritis and anemia, and unilateral choked disc may be due to orbital causes or to meningeal syphilis descending along the nerve sheath. Spontaneous recovery is rare except in children or when due to hemorrhage or to syphilis. In descending neuritis with slight swelling or changes in the vessels, but with exudate veiling the contour of the disc, vision drops rapidly. Bilateral forms are usually due to meningitis, especially the tubercular or syphilitic basal type. The epidemic form causes neuritis in 16 per cent. of the cases. It may result from nephritis, and frequently leads to post-neuritic atrophy. In atrophy it may be difficult to distinguish between simple and post-neuritic forms. The former is generally of spinal origin, beginning at the bulbar end of the nerve. Disc pallor and visual disturbance occur simultaneously.

In one form there is marked diminution of vision throughout the entire field, with marked contraction of the color fields. Deterioration is rapid, hastened by mercury, and prognosis is absolutely bad. A second class is char-

---

(1) Jour. Am. Med. Assoc., Aug. 8, 1908.

acterized by sector-shaped defects in the field of vision, with normal function, at least for quite a time, in the remaining portion, closely resembling retrobulbar perineuritis with secondary atrophy of the disc. A third variety shows concentric contraction of the field with good central vision and good color vision in the portion preserved. Similar fields are found in syphilitic disease of the intracranial portion of the optic nerve. The last two classes are benefited by mercury. True primary optic atrophy never occurs in cerebral syphilis, not, in all probability, in spinal syphilis, and is practically excluded by the presence of a central scotoma. Limitation to one eye, variations in visual function, complication with other cerebral nerve palsies, Argyll-Robertson pupil, and hemiopic defects, all speak in favor of a secondary atrophy due to syphilis. This form may also be caused by pressure on the nerve by tumor, rigid carotids or by embolism and thrombosis, as well as by retinal or choroidal disease, and by injury of the nerve in the optic canal, either directly or by indirect violence. Normal discs may be found in acute or chronic forms of retrobulbar neuritis. The alcohol-tobacco toxic type is the most common, with a long but narrow paracentral scotoma, reaching from the point of fixation to Mariotte's blind spot. The course is generally very slow, and great improvement or even recovery is possible. There is usually pallor of the temporal half of the disc. In poisoning from quinin, salicylic acid, methyl alcohol and other drugs, there is marked contraction of the blood vessels and early blindness. Lead poisoning produces papillitis, with marked vascular changes. Accessory sinus disease, influenza, syphilis, menstrual disturbances, rheumatism, are also factors.

[Notwithstanding the well known value of the perimeter in dealing with all affections of the optic nerve, one sometimes asks himself whether it is used with that frequency and persistency without which no definite information can be obtained. The trouble with this means of examination is mainly that it absorbs considerable time, requires a good deal of patience and is generally useless unless the fields are carefully measured and compared from time to time.—Ed.]

Syphilitic Arteritis of the Retina with Optic Atrophy. An interesting example of this condition is reported by Posey and Krauss.[1] A. H.; a colored woman, 42 years old, came to the Ophthalmic Department of the Howard Hospital on Oct. 30, 1907, on account of poor sight, from which she had suffered for a year or more. The loss of sight, which had been without pain in the head or eyes, had come on gradually, she thought, after a heat stroke fifteen months previously. A year prior to that, however, she had complained of feeling generally weak. Menstruation ceased one year ago without complications. It was elicited that she had had five brothers and seven sisters. Of these, three brothers and five sisters died in early infancy. The remaining brothers and sisters are generally well. Both father and mother are dead, of unknown cause. The patient was married at 14 years of age, and four years later her husband died of unknown cause. The issue consisted of three children, of whom two are living and well, the other dying when aged 2 years of probable pulmonary trouble.

Upon examination, vision was reduced to counting fingers in the right eye at 12 inches and in the left to 1/lxx. The pupils were 3 mm. in size and reacted rather sluggishly to light and convergence stimuli.

The ophthalmoscope showed an advance degree of retinal arteritis with secondary atrophic changes in the retina and optic nerve, which are well shown in the accompanying water color. (*See Frontispiece.*)

The retinal arteries in both eyes are much reduced in size, especially in the neighborhood of each disc, where they appear like mere threads. They are covered with a grayish white opacity which entirely obscures them at times, and are cord-like and shimmering and resemble silver wires. The veins are but little reduced in size, but are accompanied in places by lateral white lines, which indicate that they, too, have not escaped the vasculitis. Numerous yellowish white dots in the papillo-maculary region of the retina of both eyes mark the seat of old hemorrhages. In the right eye there is a small round hemorrhage, not far

---

(1) Ophthalmology, April, 1908.

from the disc, which has appeared since the case has been under observation.

Both optic nerves are in an advanced stage of consecutive atrophy, presenting a dull, chalky-white filled-in appearance. There are several small newly-formed corkscrew-like vessels on the head of the right nerve.

The ophthalmoscopic findings are evidently due to an unusually pronounced syphilitic disease of the retina and optic nerve arteries, and resemble in some particulars the changes seen in a case of vasculitis and perivasculitis reported by de Schweinitz at the last (1907) meeting of the American Ophthalmological Society. Unlike his case, however, there are no nasal complications, for an examination of the rhinopharynx which was made by Geo. B. Wood showed that region to be free from disease. There are also certain points of resemblance with a case of perivasculitis retinæ reported by Oliver at the same session. Vessels showing less pronounced changes are depicted in Gower's and Haab's atlases.

The changes in the blood vessels in this affection may be present a long time without occasioning retinal symptoms. As the process in the retinal vessels occurs as a rule simultaneously with endarteritis obliterans in the cerebral vessels, Schöbl[1] has suggested that the ophthalmoscopic examination is of great semeiotic importance for the general practitioner.

According to the same author,[1] Schelling in 1870 was the first to observe the ophthalmoscopic picture of this affection.

Syphilitic arteritis of the retina must be distinguished from syphilitic perivasculitis, or better, syphilitic periphlebitis of the retina. A case of this affection described by Scheffels[2] occurred in a man 18 years old, the subject of inherited syphilis. Ophthalmoscopically, the optic nerve was hyperemic and the veins were enlarged and tortuous and surrounded by dark, brownish-red hemorrhages. The arteries and retina appeared normal.

According to Parsons, "Hutchinson and Bader (1858) made the first histologic examination of vessels diseased

---

(1) Norris and Oliver, ii, p. 487.
(2) Archiv für Augenheilkunde, xxii, 1891, p. 374.

by syphilis, and this was followed by Edmunds and Brailey (1880). The latter found thickening of the walls of the vessels and infiltration around them; there was no sign of proliferation. Nettleship (1886) noted increase in the nuclei in the walls of the smaller vessels; the adventitia of the arteries was thickened, sometimes hyaline; the muscular coat was scarcely recognizable, so that arteries could only be distinguished from veins by their greater thickness; there were groups of cells with deeply-stained nuclei in the adventitia and around the vessels. In some vessels, probably veins, only the inner layers were thickened. Holmes Spicer described similar changes. Uhthoff found infiltration of the adventitia of the veins as well as of the arteries, and the aggregation of cells was sometimes so great that the lumen was invisible. Appel described annular and partial endoarteritis and periarteritis, slight infiltration of the adventitia in the veins and obliteration of many of the capillaries. Bass noted that where the vessels had pigmented around them these were most sclerosed. The obliteration of some of the vessels leads to dilation of the others in the same area."

An Infrequent Type of Optic Nerve Atrophy. Hansell[1] reports two cases due, respectively, to acute disease of the accessory sinuses, and to syphilis. The clinical picture of intracranial optic neuritis, according to Gradle, is: Sudden diminution of sight without central scotoma and with nearly normal field, tendency toward recovery but possibly ending in incomplete atrophy, with absence of all other symptoms except initial headache. In sinus disease there is always a central scotoma, if the case is examined early enough (A. Knapp). The disc may show all the signs from acute neuritis with retinal edema to a fine, almost imperceptible, deeply seated paleness. In Knapp's case there was pronounced neuro-retinitis with a radiating figure of white lines and dots about the macula. The presence of pupillary disturbance and ocular muscle paralyses indicates that the lesion is not limited to the intracranial portion of the optic nerve but has extended backward toward the chiasm or forward into the sphenoidal fissure. Head-

---

(1) Jour. Am. Med. Assoc., July 25, 1908.

ache is a common symptom. It is violent and almost continuous in sinus disease, and paroxysmal in syphilis.

Choked Disc Operations. The paper of de Schweinitz and Holloway[1] presents the subject of the *operative treatment of choked disc, and the trephining-decompression operation in its entirety.* The following conclusions, preceded by some practical *points connected with the examination of patients affected by brain tumor,* are quoted in full:

1. *The earliest date at which subsidence of the swollen disc is noticeable.*

In eleven cerebellar tumors recently observed, the first distinct lessening in the disc edema after operation, that is to say, at least 1 D. was noticed as early as the end of the first day in one case and deferred as late as the twenty-third day in another case, the average being a little over nine days. A similar analysis of nine cerebral tumors showed that the first decrease occurred in one case as early as the end of the second day, and in another case, in which there was a primary increase of the edema, it was delayed to the thirtieth day, the average being a little over ten days. A very common result, even in those cases in which the disc edema itself does not appreciably diminish for the first few days, is a lessening of the general vascularity of the eye-ground, which is often quite noticeable within a few hours after the trephining, although we have not been able to observe it while watching the eye-ground during the progress of the operation. This, however, is rather difficult to do, and doubtless future investigations along these lines may yield other results. In general terms, it may be stated that while the disc edema may subside as much as 1 D. within the first twenty-four or forty-eight hours, and quite commonly begins to subside from the third to the fourth day, an average of a number of cases usually indicates that the first distinct improvement occurs from the ninth to the tenth day. This observation is in accord with the statistics already published by Paton, who states that generally within a week or a fortnight after the second operation (all of his cases were submitted to two operations; or, rather, to two stages of operation, the first consisting in removal of the bone and sometimes

---

(1) **Transactions College of Physicians of Philadelphia, 1908.**

incision of the dura, and the second, if possible, the removal of the tumor itself) there was distinct subsidence of the swelling, but between the two operations there was little measurable alteration in the discs.

According to Mr. Gunn the date of the first occurrence of the subsidence of disc swelling and the rapidity with which it proceeds vary considerably, but are earlier and more rapid in cases where the operation has been performed not later than the third stage of disc edema. We have not found in our observations that there was any material advantage, in so far as the preservation or restoration of vision is concerned, in sudden subsidence of disc edema, or, more accurately, in rapid subsidence, with perhaps one notable exception, operated on at the Orthopedic Hospital by Dr. Taylor. Indeed, we have come to believe that the more gradual subsidence, beginning at about the tenth day, yielded more favorable results than when the disc elevation subsided more rapidly. This point, however, is one which would require further study before it could be presented in a dogmatic statement.

2. *The indications which the disc appearances give as to the size and situation of the growth; that is to say, whether it is on the right or left side of the brain or cerebellum.*

As we have already stated, and as has been pointed out many times by other observers, ophthalmoscopic examination yields no information in regard to the size or structure of a tumor, because it is perfectly well known that small growths may cause an elevation of intracranial pressure greater than large and infiltrating ones, depending upon the situation of each. If the growth has caused an increase in intracranial tension through what has been called the intermediation of an internal hydrocephalus, as Bordley and Cushing point out, the disc edema is apt to be equal in the two eyes, and it is probable, as these authors further maintain, that if every brain tumor exerted its pressure equally in all directions the swelling in the two discs would always be likewise equal. This we know is not always the case; and, moreover, under certain circumstances there is a greater pressure of fluid in the optic nerve sheath on one side than the other, and therefore a greater swelling of the optic disc in one eye than the other. Whether this greater swelling on one side is a sufficient indication that the growth is also upon the same side of the intracranial contents is a matter of dispute. Thus, Sir Victor Horsley holds that the disc edema, or neuritis as he calls it, occurs first of all, or is more intense, on the side of the tumor, while Mr. Leslie Paton's observations indicate that no reliance can be placed on this sign, for although the preponderance was somewhat in favor of the more severe neuritis being on the affected side, yet in some cases it was more marked on the opposite side. On the other hand, Sir William Gowers, and apparently Dr. Beevor, agree with Horsley in regard to the homolaterality of the disc swelling and the tumor. Touching this point, Bordley and Cushing state that in 70 per cent. of their cases the papilla on the side of the tumor was the most involved, and in 80 per cent. of the cases seen before the choked disc made its appearance the first swelling ultimately occurred in the eye homolateral to the tumor, and in 72 per cent. the ultimate damage to the nerve was greatest on this side.

So far as we are able to judge from our own experience, we would say that in the majority of cases the greater swelling is on the same side as the tumor, but we would agree with Horsley, Cushing, and others, that it is not so much to the swelling of the disc that attention should be paid as to the indications as to which disc has been longest affected by finding the evidences of beginning atrophy, by attention to which side of the disc has first been affected, the nasal or the inferior quadrant, and by the information which is given by a test of the visual acuteness, the light sense, and the field of vision. As Bordley and Cushing point out, a tumor may, for instance, be present on one side of the brain, and by the character of its growth impinge on the opposite side and cause an unequal forcing of cerebrospinal fluid into the introvaginal sheath of the optic nerve, and therefore a greater swelling of the disc on the opposite side of the tumor; or it may happen that the examination is made when the disc which was originally the largest in size had already begun to decline, and this would throw an element of doubt on the examination.

Therefore, the mere swelling alone does not furnish the most important information, but the other symptoms, to which we have called attention. So sure of this is Sir Victor Horsley that he states: "Within my own knowledge the early failure of visual acuity indicates beyond doubt the situation of the tumor." The essential point, according to him, is the estimation of the age of the neuritis, and this means minute examination of the interstitial tissue of the disc.

3. *Delay in the development of the optic disc changes.*

We have already pointed out that there is some reason to believe that a study of the refraction of the eye is of some importance in the determination of this point, and that although all observers are not in entire accord, there is a good deal of evidence to show that in the presence of myopia the disc changes do not develop as quickly as when the other type of refraction is present.

A still more interesting question in this connection is the age of the patient, and if Singer's tables are correct, the absence of optic neuritis, or disc edema, in intracranial tumors, exclusive of those occurring in the pons, is rare in cases under forty years of age and becomes increasingly more frequent after that period of life. Thus in an analysis of 88 cases of cerebral and cerebellar tumors, he found in 35 cases under thirty years of age well-marked choked disc in 97.1 per cent. of the cases, and its late or slight development in only 2.9 per cent. of the cases, it being absent in none of them. Between thirty and forty the figures read thus: 18 cases, well-marked neuritis, 76.6 per cent; late or slight neuritis, 2.2 per cent.; absent, 1.1 per cent.; between forty and fifty the neuritis was well-marked in 61.9 per cent. of the cases, 21 in all, and absent in 19; while over sixty years of age in 7 cases it was not well-marked in any of them, late or slight in 14.3 per cent. of them, and absent in 57.1 per cent.

If these figures are correct, and we shall return to more elaborate analyses at some future time, the search for the earliest stages of papillo-edema, according to the directions already given, in cases of suspected brain tumor after the thirtieth year of life, becomes increasingly important.

In final conclusion we would say:

1. The most satisfactory treatment for the purpose of preserving vision in any case of choked disc or papillo-edema not due to a toxic process or constitutional disease ("infectious optic neuritis"), but depending upon increased intracranial tension, is decompressing trephining, with the removal of the growth if it is accessible.

2. This operation should be performed early, and if it can be done during the first, second, or even third stage of papillo-edema, the prognosis as to sight is most favorable.

3. If for any reason the operation is postponed until the development of the fourth and fifth stages of papillo-edema, already associated with marked depreciation of vision, the prognosis as to sight is unfavorable; but, even under these circumstances the operation should be performed, because it sometimes preserves such vision as still remains, and if it should happen to be followed by a rapid depreciation of vision, as, unfortunately, is apt to occur, it at least gave the patients a chance, because without it they are doomed to blindness.

4. The investigation of the eyes under these circumstances must include not only an ophthalmoscopic examination, but one which includes a careful investigation of the visual field, the color perception, light sense, size of the blind spot, etc.

5. Patients afflicted with papillo-edema dependent upon increased intracranial tension should have the case fairly stated to them, and the operation should be urged in spite of occasional unfavorable results, because in its absence ultimate blindness is almost sure to result.

Decompression in Choked Disc. An interesting paper on this important subject has recently been contributed by George Robinson.[1] He thus describes the results of this procedure in a case of dioptric neuritis in which the swelling of the papilla in the worse eye equaled 7 diopters. The operation of decompression was advised and the subdural space was opened in the occipital region, by J. Thompson Schell, on each side by means of a trephine. These openings were connected by removal of the intervening bridge of bone with the Rongeur forceps. Upon removing the button of bone on the right side, the dura

---

(1) Ophthalmology, January, 1909.

bulged outward, and the incision was followed by the escape of a considerable quantity of cerebrospinal fluid. No growth was demonstrable. Upon opening the left side, the dura did not show evidences of internal pressure; there was no escape of fluid nor the presence of a growth.

In three days' time the patient reacted well. He had had only one or two attacks of headache since, and these very mild. He fixed with either eye, the excursion outwardly being much improved; diplopia being present only upon strong abduction. With the ophthalmoscope the swelling of the optic discs had greatly reduced (+ S. 3 D. to + S. 4 D.), their borders being still obscured and the retinal edema subsiding. The patient left his bed and left comfortable. There was some improvement in gait, although the patient was weak. The ocular excursions were still improving. There was no diplopia upon strong effort in any direction. With the ophthalmoscope, the apex of the disc could be best seen with + S. 2 D., the vessels being better defined and of relatively normal size. The retinal edema was very much reduced. There were but a few small hemorrhages on the disc. There was a small vitreous opacity in the right eye. The margins of the discs were hazy.

Three days later the patient was discharged from the hospital. Examination at this time showed perfect ocular excursion in all directions, there being binocular single vision. Esophoria equaled six degrees; vision equaled 15/xl. On October 2 vision equaled 20/lxx and 20/xl partly. The esophoria had been reduced to three degrees. On Oct. 12, 1908, vision equaled 20/xl and 20/xxx partly. The apex of the disc was but + S. 1 D. to + S. 2 D. A saturated solution of iodid of potassium in increasing doses three times daily was ordered.

The course of this case seems to the author to confirm the opinion of Horsley, that simple opening of the calvarium is not sufficient, but should be associated with free incision into the dura. There are two places where the cerebrospinal fluid is held by the arachnoid, in the form of a cisterna, which can readily be approached: (1) the interpeduncular cisterna by way of the squamous portion of the temporal bone, and (2) by the subtentorial route through the occipital bone, attacking the cisterna beneath the cerebellum.

"Few things," says Horsley, "are more striking after operation for intracranial tumor than to see the rapidity with which the swelling and degenerative changes of the disc and retina clear up. Certainly it seems to occur with the same rapidity whether the operation is performed above or below the tentorium."

The location of the tumor may be determined by the age of the neuritis being upon the side where the changes have advanced the more, regardless of the amount of swelling. The degree of atrophy may be considered a guide to the prognosis of the amount of relief afforded by an operation. Neurologists generally are agreed that decompression is usually associated with subsidence of choked disc, regardless of the continued presence and growth of the tumor.

In conclusion the writer believes with Horsley, that the question of the saving of sight, even in people who are the subjects of a fatal disease, is so important as to include all classes of cases: (1) those in whom it is possible to remove tumors and get them well; (2) those who have meningitis and recover, and (3) those who have malignant disease and ultimately succumb.

Horsley[1] believes that all these cases of optic neuritis should be relieved as soon as possible by operation. The operative treatment, in the absence of other indications, should be *opening of the subdural space in the temporal or subtentorial region.* The attending physician must be held responsible for consequent blindness if the neuritis be not thus relieved as soon as possible.

In this connection Edward Stieren (*Ophthalmic Record,* p. 150, 1908) properly says:

"In predicting the degree of vision that will be attained, much depends upon the ophthalmoscopic picture before operation. If signs of degeneration of the retina, especially in the region of the macula, are present the prospects are usually not of the best for recovering a useful degree of vision. Edema of the nerve, moderate edema of the retina with small hemorrhages, exudates along the course of the vessels and even larger exudates not in close proximity to the macula, need not deter us from expecting good results, for it has been demonstrated that these lesions disappeared or did not seriously interfere with vision after the retinal circulation had again been established."

---

(1) The Ophthalmoscope, September, 1908.

Lumbar Puncture in Intracranial Hypertension and its Therapeutic Value in the Eye Complications. This procedure, says Frankel,[1] while considered palliative in tuberculous meningitis, has a number of cures to its credit in the non-tubercular forms. It appears to be particularly effective in the clinical type described by Quincke under the name of serous meningitis. In many cases of meningeal hemorrhage, particularly the traumatic, the method may be indicated when there is no urgent necessity to evacuate the blood. Palliative results are obtained in hydrocephalus. In optic neuritis from cerebral tumor prudence should be used in treatment by lumbar puncture, as in some cases sudden death has followed it, and in others there has been an aggravation of the nervous symptoms, particularly of headache and vomiting. In the uremia of Bright's disease there may be real relief, though only of symptoms. In labyrinthine diseases of the ear lumbar puncture diminishes the vertigo and tinnitus and even the deafness.

In all three cases the effect is obtained by diminution of the tension produced by the excess of cerebrospinal fluid. There is a very reliable clinical sign of this hypertension in the optic neuritis of stasis, and the diagnostic and therapeutic value of lumbar puncture in optic neuritis has attracted the attention of neurologists and ophthalmologists.

Frankel reports the following case: A rather delicate girl 21 years old applied for treatment in May. Since December she had had intermittent headache increasing in violence. Later there were diminution of vision, photophobia, blepharospasm and convergent strabismus with diplopia.. Ophthalmoscopic examination showed well marked double optic neuritis with swollen discs, shrunken arteries and dilated and tortuous veins; temperature and pulse practically normal. In the last of May there was increased headache with vomiting and convulsions. In

---

(1) Annales d'Oculistique, January, 1908.

June the patient became comatose and 8 c.c. of clear cerebrospinal fluid without albumin and free from lymphocytes were withdrawn by lumbar puncture, with immediate and marked improvement of the symptoms. June 7, the headache and convulsions returned and the puncture was repeated with immediate relief. There was recurrence of symptoms from time to time but gradual improvement, and at the last of June a considerable increase of vision was noted and the papillæ were less swollen. Mercurial treatment had been administered. On July 6 V. = 1, and fundus practically normal.

The author thinks that the symptoms and history of the case justify the diagnosis of serous meningitis and that the cure was due to the lumbar puncture, though the effect of the mercurial treatment cannot be excluded.

Babinski and Chaillous[1] think that the therapeutic value of *lumbar puncture in ocular pathology* has not yet been thoroughly studied. According to the observations of Drualt, papillary edema, as well as other symptoms of cerebral compression, may disappear after evacuation of cerebrospinal fluid, but the result is far from being constant. Quincke joined a vertical glass tube to the needle used to make the puncture to enable him to measure the pressure of the cerebrospinal fluid and establish the relation between intracranial hypertension and the symptoms that are attributed to it. In this way, in case of choked disc, lumbar puncture may aid the diagnosis, and it may be repeated if it causes any improvement.

The authors report eight cases of swollen disc treated by lumbar puncture.

Case 1. This was traumatic, the result of a fall upon the head. After the withdrawal of fifteen c.c. of cerebrospinal fluid, there was immediate improvement, and ultimately complete return to normal.

Case 2. In addition to the swollen discs there were paresis of the right exterior rectus, violent headache, etc., all probably due to a meningitis of unknown etiology. Two lumbar punctures were made, with an interval of about a week, and were followed each time by improvement in the

---

(1) Annales d'Oculistique, July, 1907.

symptoms. Seven or eight intramuscular injections of calomel were also made. Complete recovery resulted.

In case 3, also due to meningitis of obscure origin, there was blindness of the right eye and considerable diminution of vision in the left. O. D., no light perception, O. S., vision equaled fingers at 20 cm. After withdrawal of 20 c.c. of cerebrospinal fluid, the headache and vomiting disappeared. A few days later the puncture was repeated with immediate improvement of ocular symptoms. Mercurial treatment was also applied. The final result was recovery with V. = 7/x in each eye.

Case 4 was one of meningitis, probably syphilitic. Vision and field normal in each eye, but vision disturbed by diplopia from paralysis of left exterior rectus. There were marked edematous neuritis of both eyes and retinal hemorrhages in the right. Lumbar puncture, which showed a decided lymphocytosis of the cerebrospinal fluid, was followed immediately by improvement in the appearance and the swelling of the papilla, and the diplopia disappeared. Injections of iodid of mercury were used.

Case 5. Meningitis of unknown origin. Papilla edematous and swollen, paralysis of external rectus, fields contracted. O. D. 5/xxx, O. S. 1.5/50. 25 c.c. of cerebrospinal fluid evacuated by puncture and ten minutes afterwards V. O. D. 5/xv, O. S. 2.5/50, and visual fields enlarged by 10°. Iodid and mercury administered. A few days later the diplopia had disappeared and the swelling of the discs had diminished. Result two months later, discs flat but somewhat pale and V. 5/xv in each eye.

Case 6. Meningitis, violent headache, etc., and double optic neuritis. V. O. D. 5/x, O. S. 5/x. Injections of calomel. A week later no improvement in symptoms. Immediately after puncture V O. D. 8/x, O. S. 9/x. Later the papilla were almost normal, but subsequently the nervous and ocular symptoms increased and the vision diminished.

Case 7. That of a hydrocephalic child one year old. Double optic neuritis had been noted eight months earlier. In three months four lumbar punctures were performed. There was improvement in the child's general condition and the swelling of the nerves diminished. Mercurial inunction was also used.

Case 8. Cerebral tumor with right hemiplegia and troubles of speech. Jacksonian epilepsy. Ophthalmoscopic examination negative. Mercurial treatment. Several months later typical double edematous neuritis. After seven or eight punctures there was transient diminution of papillary edema, but later it increased. A tumor was removed by operation and the patient died immediately afterward.

The relief, sometimes so immediate, of visual trouble following lumbar puncture, favors the theory of Dupuy-Dutemps, who claims that pupillary edema is due to compression of the central vein in its passage through the dural sheath.

The authors conclude that lumbar puncture should be considered a therapeutic measure in case of papillary edema due to traumatism or inflammation, while in intracranial tumors it can be only palliative. That it is well to repeat the puncture as often as may seem necessary to avoid the effects of compression, particularly, atrophy of the optic nerve.

[The experience of American operators seems to incline them to *trephining* (*decompression*) *rather than lumbar puncture* in cases of cerebral hypertension. The danger is at least no greater than in lumbar puncture and the results are regarded as more satisfactory, and more permanent. —Ed.]

Cyanosis Retinæ. Tyson[1] gives a brief review of the etiology and pathology of general cyanosis due to congenital cardiac disease, and details a case of cyanosis retinæ occurring in a patient aged 12 years, in which a diagnosis of congenital patent, foramen ovale with pulmonary stenosis was made.

The clinical history and the anatomic pathology of a case of *bilateral amaurosis which developed suddenly in a patient with congenital cyanosis* is given by Baquis.[2] The patient was a male, 11 years of age, who complained of severe dyspnea and of a cloud before his eyes. V. in

---

(1) Archives of Ophthalmol., September, 1908.
(2) Graefe's Archiv. f. Ophthal., II, 1908.

O.D.=L.P.; O.S., hand movements, 30 cm. The entire skin, from the scalp to the extremities, was of a deep violet color. The visible mucous membranes were also involved. There were no hemorrhages. The superficial veins were everywhere visible, more through the number of their branches than through their dilatation, as the larger trunks gave the impression of being empty and flat. The heart was enlarged and there was a presystolic murmur over the apex. The radial pulse was 120. The liver and spleen were enlarged. The blood was brown from hyperglobulin. Red cells 8,500,000; white 23,000; hemoglobin (Fleisch) 112 per cent.

The skin of the lids was blue-brown, which in the tarsal conjunctiva and the retrotarsal fold reached the color of tartar. The bulbar conjunctiva was cyanotic and over it coursed coarse, almost black veins. There was exophthalmus due in part to widening of the fissure and in part to engorgement of the retrobulbar orbital tissues. The pupils were partially dilated and reacted sluggishly to light. The irides were blue, but that of the right eye was less brilliant and had a somewhat yellowish tint, probably the result of irritation, as there was in this eye slight pericorneal injection. In the right eye no ophthalmoscopic examination was possible, as on the temporal side only a faint reddish glare could be obtained, and everywhere else but a brown reflex. In the left eye all of the arteries except the superior and inferior branch, for a short distance, had completely disappeared. The veins had enormously developed and coursed with extreme tortuosity as large black bands. In the entire retina every venous twig was visible because of its distention. In their course was found knots and pouch-like ectasias. Round, striated and splotched hemorrhages were everywhere visible. The changes were active and the white, scattered retinal spots of atrophy showed that they had long been in progress. The papilla had lost its normal color and its edges were invisible. Its position was indicated by the prominence of the vascular trunks. The macular region was beset with hemorrhages. The surface of the retina was as if covered by a fine grey veil, probably the result of connective tissue proliferation. The retina was seen with a +7 D.

Ten days after this examination the iris tissue of the right eye underwent a sudden change in color, from blue to chestnut-brown, accompanied by signs of iritis, but the pupil dilated fully without leaving pigment on the lens capsule. Five days later similar changes occurred in the left eye. The binocular loop showed enormous distention of the blood vessels of the iris. The swollen and tortuous vessels formed a pupillary and a ciliary network, which projected from the surface of the iris like a blood sponge. The color of the vessels (which were apparently veins) was a deep brown.

In patients suffering from congenital general cyanosis there is observed at times an ocular complication known as *cyanosis retinæ.* This term, which seems sufficient for cases of slight or moderate intensity, is incomplete for severe cases, which are better described, Baquis believes, by the term *cyanosis oculi.*

In simple cyanosis retinæ, which is compatible with normal visual function, there is observed, ophthalmoscopically, besides the brown coloration of the vessels, a distention of both the veins and the arteries. The explanation of this phenomenon is that in mild general cyanosis the blood does not contain sufficient carbonic acid gas to strongly stimulate the vasomotor constriction center, and this leads through moderate stimulation to constriction of the visceral vessels, thereby forcing the blood into other organs and there among the retina, causing dilatation of its vessels.

In severe cases of general cyanosis the ocular fundus picture completely changes. The blood, overcharged with acid, produces marked stimulation of the medullary centers, and produces much more intense and more general vasomotor constriction, including the retinal arteries. In the ophthalmoscopic examination one sees, in fact, the veins greatly distended, and the arteries, on the contrary, unusually constricted, indeed in some places they have apparently disappeared. The constriction of the arteries leads to an intense venous stasis, and upon this follows diffuse apoplexies, venous and arterial thromboses, and also diffuse intraocular hemorrhages, which finally call attention to the eyegrounds. The visual function is, in these cases, rapidly and completely destroyed from the beginning of the attack.

The iris is, because of the arterial spasm, the seat of a decided venous stasis and, because it is changed into an actual blood sponge, alters its color, so that if it were originally blue it becomes a chestnut brown.

The iridocorneal angle is the seat of a slow inflammatory process which leads to its obliteration and to a glaucomatous condition, which may reach such a high grade that it causes rupture and subsequent atrophy of the globe. This union of intense and incurable changes of the entire eye produces a clinical picture which may well be termed *cyanosis oculi,* the one cause of which is an intense arterial spasm excited by carbonic acid stimulation of the medullary centre. Such vessel changes have the heretofore unknown characteristic that they produce a constriction and also obliteration of the lumen of the vessels, not through the usual process of endarteritis, but by a primary contraction of the muscle coat, which later, as the result of a hypertrophy of its elements, is compensated for. A proliferation of the intima can be observed at most in the final stadium of the disease after thromboses and hemorrhages have occurred.

Central Holes in the Retina. Twietmeyer[1] reports 2 cases, caused by contusions of the eyeball through blunt objects. The macular region was at first opaque, the veins engorged and tortuous. In from about 10 days to 3 weeks a round hole, half the size of the optic disc, had formed at the macula, the depth of which was of a marked lower level than the surrounding retina. It was red and was covered with white dots, and surrounded by a diffuse grayish opacity, gradually passing into normal retina. In the second case this opacity showed also a great number of shining yellowish crystals. Subjectively a central scotoma corresponded to the seat of the affection.

TOXIC AMBLYOPIA.

Tobacco Amblyopia Dowling[2] believes that of all the toxic amblyopias, *that produced by tobacco is the most*

---

(1) Zeitschr. f. Augenheilk., p. 447, 1907.
(2) Lancet-Clinic, July 13, 1908.

prominent and frequent. A number of cases are recorded and the results of examinations of a large number of employes in cigar factories and tobacco warehouses are given. The negro race seems immune from tobacco blindness. The majority of those examined had contracted pupils, most marked in those having strong evidence of tobacco infection. The usual sufferers are males between the ages of 35 and 68 years. There is almost always a gradual but progressive failure of visual acuteness in both eyes. Luminous objects dazzle the eyesight, and these patients see better in the evening than in the middle of the day. The ophthalmoscopic examination of the eyes reveals the papilla of the optic nerve to be more than usually red in the early part of the affection. Later it appears anemic, especially on the temporal half, and finally atrophy of the disc takes place. He says these changes in the papilla are probably caused by direct action of the nicotin, which enters the circulation. The prognosis is good if the case is taken early, sometimes complete recovery occurring, and always improvement. From 6 to 12 weeks' treatment are usually necessary. Tobacco and alcoholic drinks are forbidden. The antagonism between nicotin and strychnin has made the latter valuable in the treatment of this disease.

Wood Alcohol Blindness. Louis Stricker[1] reports 2 cases of blindness from the *inhalation of wood alcohol,* and says in all there are 17 cases reported. Wood and Buller have reported 153 cases of blindness and 122 cases of death from drinking wood alcohol. They also reported 3 cases of blindness from rubbing wood alcohol on the body. A recent examination of toilet articles shows a long list of hair tonics, which the writer names, in which wood alcohol was used. The writer has, in tobacco and alcohol amblyopia, contrary to the findings of Uhthoff, found a decided narrowing of the color fields or total loss of color sense. Mechanical interference with the entrance or exit of blood from the eye, or arteriosclerosis following alcoholism, excessive use of tobacco or lead poisoning, may interfere with the nutrition of the retina, and explain the contraction of the color fields. In most cases, ophthalmo-

---

(1) The Lancet-Clinic, May 2, 1908.

scopically, the picture is negative, occasionally there is a slight hyperemia of the temporal side of the disc or rarely pronounced optic neuritis with flaming hemorrhages in the retina. He believes that "The uncomplicated toxis amblyopias ought to be considered as retinal diseases." After discussing in detail the action of poisons on the nerve elements he says: "As a general proposition, one might say intense poisons produce sudden death of the ganglion cells, atrophy and death of the axis cylinders, and there is no restitution. Chronic poisoning first induces death of the axis cylinders; here prompt interference will arrest the process, and in all probability lead to a subsequent regeneration of the axis cylinders; but where the poison has acted for a long time the ganglion cells die, after which there can be no possible restitution of the axis cylinders." The writer emphasizes the physico-chemical side of this question, and directs attention to the experimental study of Reid Hunt. He believes that methyl alcohol acts especially on the most highly differentiated nerve structures. From experiments of de Schweinitz and others, it is believed that the methyl alcohol is changed into an aldehyde, then into formaldehyde, which is rapidly changed into formic acid within the body. It is shown by Hunt that the physiologic process of metabolism in the cell of a moderate drinker is changed; that instead of inhibiting oxidation, alcohol increases this power of oxidation, so that substances, which in the case of an abstainer would remain harmless, in the alcoholic are rapidly oxidized and may produce substances which act as a poison to the cells. This may explain these cases of suddenly developed amblyopias in individuals who have practically been moderate drinkers all their lives, and in whom no recent excess can be called upon to explain this sudden attack. "Is it not possible that food products which undergo decomposition (ptomains and leucomains) in the intestinal tract, or even products absorbed, may become toxic in an alcoholic owing to the increased power of cells to split up the molecule, and thus produce substances which produce blindness and death?"

[Stricker was probably the first to publish reports of *cases of death as well as blindness from inhalation of wood alcohol vapor*. Within the period of its employment in

America several of these cases (almost invariably among beer-vat varnishers) have occurred, thus emphasizing the fact that the most virulent forms of poisoning by inhalation are found when the fumes are associated with rebreathed air.—ED.]

Carhart[1] also reports a typical example of *blindness from methyl alcohol inhalation.* C. S., aged 23, a painter by trade, came with a history of being blind in both eyes for 24 hours. He had been working the past 3 weeks in *shellacing the interior of beer vats.* For 3 days previous he had had attacks of nausea and vomiting. The vessels of both fundi were markedly engorged, both optic discs obscured by a swelling of their substances, greater above and below than laterally, the right eye being the worst. After free diaphoresis and catharsis were produced, iodid of potash and strychnin were used in increasing doses. In the left eye vision increased to 3/cc, in the right to perception of shadows, the appearance in each eye being that of partial optic atrophy. The engorgement and swelling of the discs gradually disappeared. The close confinement of the air in the vats was the apparent cause. The picture was such as may be caused by taking wood alcohol in bulk, but this occurred only from the inhalation of the fumes.

[Although much has been done to abolish the use of methyl alcohol in the trades something still remains of accomplishment. Having had a recent case of wood alcohol intoxication and amblyopia and having been consulted at a distance regarding several others, I was induced to write Mr. Henry Dalley, chairman of the Committee of Manufacturers, formed to assist in securing cheaper alcohol for industrial purposes—an organization that has done more in that direction than any other activity I am aware of. My inquiries related more particularly to the progress that is being made to substitute the inocuous, "denatured" alcohol for the more poisonous methyl alcohol, especially in the form of Columbian spirits. The secretary, Mr. J. H. Allen, kindly wrote me the following letter, which ought to be of interest to every physician and especially to every ophthalmologist:

"Dear Sir—We are in receipt of your letter of January

---

(1) Am. Medicine, April, 1908.

20 and note with interest your statement in regard to recent cases of serious injury and death caused by wood alcohol.

"In reply to your inquiries regarding the sale of denatured alcohol, would state that so far as we can learn the manufacturers of denatured alcohol are making all possible efforts to induce retail druggists of the country to handle this product. We are advised that one concern manufacturing the denatured material sent out circular letters, calling attention to their product, to more than 25,000 retail druggists, and that they are constantly in communication with all the wholesale druggists of the country in regard to pushing its sale.

"There is no good reason why any wholesale or retail druggist should prefer to sell wood alcohol or Columbian spirits instead of denatured alcohol, as the latter material has always been from 3 to 5 cents per gallon cheaper than the ordinary inferior wood alcohol, and from 25 to 30 cents cheaper than Columbian spirits.

"It is true that at first the regulations governing the sale of denatured alcohol required compliance with certain troublesome details, but these regulations have been amended so that there is now absolutely no reason why this material should not be sold as freely as sugar, salt, or any other ordinary article of commerce.

"The simple truth, so far as we can ascertain, is that the retail druggists have been expecting to make as much profit on a gallon of denatured alcohol, costing 40 or 45 cents, as on a gallon of tax-paid ethyl alcohol, costing $2.50. The writer has purchased denatured alcohol from three drug stores within a half a mile of each other in this city, paying at one store 30 cents per quart, at another 40 cents, and at the third 55 cents. At the same time the wholesale price of denatured alcohol was 40 cents per gallon.

"We believe it would be advisable for the newspapers of the country to call attention to the fact that denatured alcohol should be readily obtained not only at drug stores, but from dealers in oils, paints and varnishes, etc. We understand that a number of the dealers in the latter material are now carrying denatured alcohol, and believe that ultimately they and the grocery stores will be the principal dealers in this material.

"We send you under separate cover copy of the special denatured alcohol issue of *Harper's Weekly* (Oct. 3, 1908), in which you will find considerable information relating to this subject.

"We enclose copy of the recent annual report of the Commissioner of Internal Revenue, which you will find of interest in this connection.

"We note your statement that druggists say that they naturally give their customers what the latter ask for. We have found in many cases that this is not true, as parties ordering denatured alcohol have been given wood alcohol. However, this is a matter that will in time be worked out satisfactorily by the competition of merchants handling this material.

"We also send you under separate cover copy of a pamphlet advertising denatured alcohol, of which we understand that several hundred thousand copies have been distributed in all sections of the country."—Ed.]

Lead Poisoning With Eye Symptoms. A woman, aged 30, took for an indigestion, instead of bicarbonate of soda, a teaspoonful of red lead oxid with some water. After about 2 weeks Wirsing[1] noted symptoms of lead intoxication: colic, headache, tinnitus, palpitations of the heart, dyspnea, profuse perspiration, vomiting, vertigo. About 2 months after the accident her memory failed and visual disturbances set in with diplopia and micropsia. Then she became drowsy and could not recognize anybody, so that she had to be brought to the hospital.

The examination of the eyes by Helbron, 6 weeks after admission to the hospital, revealed: V. R. =5/v, V. L.=5/vi Left mydriasis, reaction of both pupils sluggish, paresis of left superior oblique, contraction of left visual field from 15° to 20°, color perception normal, optic neuritis, with commencing atrophy in left eye. Under pilocarpin instillations, warm baths and iodid of potassium, a rapid improvement took place of the general and eye symptoms, and the paresis of the left trochlearis was perfectly cured.

---

(1) **Deutsche med. Woch., p. 1845, 1907.**

Wirsing emphasizes the great discrepancy of authors as to the frequency of lead poisoning. Lewin mentions 187 cases and says that amblyopia saturnina is a rather common occurrence among the working men in the lead mines of the Oberharz.

Amblyopia saturnina has been observed without any objective symptoms and is thus analogous to the anesthesia saturnina of the peripheral nerves; or it may be due to uremia, anemia of the retina from arterial spasms, or a symptom of incipient or complete papillitis, neuroretinitis, commencing atrophy, occasionally simulating cerebral tumor. Hemianopsia, hemiachromatopsia, affections of the sympathetic nerve, with oculopupillary symptoms; narrowing of the palpebral fissure, spastic miosis of the ocular muscles in various combinations, as pupillary affections from paresis of the 3rd nerve, have been described.

Disturbances of the Color Sense in Internal Diseases. From literature and his own observations, Hilbert[1] has noted many *disturbances of the color sense in internal diseases:*

Fifteen cases of *erythropia,* of which 5 occurred in neurasthenia, 3 in hysteria, 2 in general paresis and 1 in each of the following affections,—epilepsy, choroiditis, atrophy of the optic nerve, anemia and hematemesis from interstitial hepatitis.

Twenty-two cases of *xanthopia,* viz.: 3 in neurasthenia, 1 in epilepsy, 2 in helminthiasis, 2 in icterus, 1 in insolation, 1 during menstruation, 3 in hemeralopia, 2 in influenza, 1 in diabetes, 1 in concussion of the brain, 1 in typhoid, 1 in otitis media, 1 in Weil's disease, 1 in arteriosclerosis. Here Hilbert remarks that the old Hindus were familiar with the yellow vision of icteric persons.

Twelve cases of *kyanopia:* neurasthenia 4, hysteria 1, atrophy of the nerve 1, nephritis 1, coryza 1, malaria 1, arteriosclerosis 1, influenza 1, apoplexy 1.

Sixteen cases of *chloropia:* neurasthenia 3, tabes 2, choroiditis 2, nephritis 2, prolapse of iris 1, hemicrania 1, syphilis 1, paresis 1, epilepsy 1, sympathetic ophthalmia 1, psychosis 1.

Four cases of *ianthinopia:* otitis media 1, choroiditis 1,

---

(1) **Klin. Monatsbl. f. Augenheilk., p. 256, 1908.**

tabes 1, influenza 1. The enumerated disturbances occurred in different forms. Either the whole visual field appeared in one color, or the sensation was perceived in colored scotomas or was of hemianopic character. In the majority of cases, in 44 out of 71, the phenomenon was due to diseases of the nervous centers, and Hilbert concludes that also in affections of other organs it had a central cause and is to be considered as a kind of hallucination of color.

Blueblindness Caused by the Yellow Color of the Lens. Hess[1] has proved by his observations on a case the fact that the yellow color of the human lens, without impairment of its transparency, may produce, by absorption, complete blueblindness. A woman, aged 69, who had V. with —20.00 6/xl and read the finest print (Nieden No. 1) fluently at from 5 to 6 cm., could not discern blue colors. In mydriasis the lens, examined by daylight, yielded a very dark brownish yellow reflex, while with the ophthalmoscope the pupillary area appeared uniformly red, and showed no radial opacities of the lens. The fundus could be easily seen, and appeared normal, excepting a narrow conus. Intense light had no glaring effect.

In testing her color sense, Hess found that she called colors as they appeared to him through yellow glasses. A blue pigmented paper appeared to the patient almost grayish black. Tested with the spectrum, she saw only the red, yellow, and barely the green squares, while the greenish blue, blue and violet squares, very plainly visible to a normal eye, were not perceived. Hess compares this shortening of the spectrum in its short-waved portions with his observations on chickens and pigeons, in which this is due to absorption of the short-waved light by the yellow and red oil globules of the cones. The terminal light has a similar composition in both cases; its lack of short-waved rays in both is produced by absorption through a yellowish red and yellow filter, which in daybirds consists in portions of the retina, in the patient in the lens.

Hess says it is generally true that the coloration of the lens increases with advancing age, but not equally, as lenses of relatively youthful eyes are not rarely more yellow

---

(1) Archiv f. Augenheilk., p. 29, 1908.

than those of older persons. Hering proved that the lens of the newborn is yellow. For illustration, 9 lenses of persons between the ages of from 7 to 70 of different shades of yellow are depicted.

Blindness Following the Injection of Protargol Into the Lacrimal Sac. A woman of 50, who was suffering from an acute phlegmon of the sac which had ruptured on the face, was treated by Park Lewis[1] in the usual manner until inflammatory symptoms subsided somewhat, when probing was begun and the passage syringed with 25 per cent. protargol. No reaction followed until this was done the second time. Two days later she 'phoned that great pain came on shortly after leaving the office and that the eye was blind. She was at once directed to return, when the eye was found proptosed from an orbital cellulitis. Pupil was dilated and immobile. No light perception. The soreness and swelling gradually disappeared, leaving the eye blind from optic atrophy. It is presumed that the cellulitis was induced by some of the protargol escaping from the sac into the orbital tissues.

Argyrosis Due to the Use of Argyrol. An example of this rather common form of staining by the organic compounds of silver is reported by F. Krauss.[2] A child of 4 years who had purulent dacryocystitis was given a 20 per cent. solution of argyrol to drop in the eye twice daily. It was used 20½ months. The ocular and palpebral conjunctiva became colored a bluish green tint.

[It is strange that almost every case of prolonged argyrosis from the use of protargol or argyrol results from its employment in lacrimal diseases. In most other instances only superficial staining or a temporary discoloration is produced. No doubt the cellular inflammation that so often follows diffusion into the tissues is largely responsible for its permanency.—ED.]

Paralysis of the Sixth Nerve After Lumbar Anesthesia With Tropacocain. On the eighth day after lumbar injection of 0.0625 tropacocain (without adrenalin) between the 1st and 2nd lumbar vertebræ, Gontermann[3] noticed

---

(1) Ophthalmic Record, June, 1908.
(2) Ophthalmic Record, March, 1908.
(3) Berlin. klin. Woch., p. 1522, 1908.

the left abducens become paretic; also the right one slightly. Recovery occurred after 6 weeks. The late occurrence of the paralysis spoke for a toxic affection of the nuclei, not through direct local action, but by way of absorption, similar to nephritis after lumbar anesthesia and other palsies.

THE OCULAR MUSCLES.

A Case of Hereditary Nystagmus. The history of a man aged 31, who had, from early childhood, horizontal nystagmus, is furnished by Caspar.[1] There was irregular and regular myopic astigmatism of right eye; with correction V=5/l; hypermetropic astigmatism of left eye; with correction V=5/xxx. Fundus, excepting atrophy of the choroid around the optic nerve, was normal in both eyes. His 2 brothers, none of his 5 sisters, the 2 sons, none of the 5 daughters, of the sister of his mother had the same affection; none of the 5 daughters of the second sister of his mother, nor the son, nor one of the 5 daughters of the third sister of his mother. The history shows a hereditary transmission of nystagmus through the parents of the mother to the male descendants. Next to the great number of children the predominance of the female progeny is remarkable. There was, probably, a hereditary syphilitic element.

[All who are interested in the subject will await with much interest the investigations of Mr. Nettleship on the subject of hereditary nystagmus. I am sure he will be pleased to have accounts of unpublished cases sent him.—Ed.]

The Visual Defect in Miners' Nystagmus. Snell[2] calls attention to the fact that Sheffield may not inappropriately be called the cradle of the study of industrial diseases, citing Knight's early studies in knife-grinders' phthisis and Hall's work on lead poisoning, especially among file-cutters. Snell himself has paid particular attention to the eye diseases and injuries connected with Sheffield trades, and mentions:

---

(1) Centralbl. f. pkt. Augenheilk., p. 199, 1908.
(2) Brit. Med. Jour., Aug. 1, 1908.

Diseases due to occupations involving prolonged use or excessive strain of the eyes and their muscles, such as nystagmus in coal miners and in other employments.

Those due to occupations which involve the use of poisons, such as dinitro benzol, used in making explosives, carbon disulphide, and so on.

Effects of exposure to excessive light or heat, as in burnishers, steel smelters, electric welders, bottlemakers, and others.

Injuries amongst grinders, iron and steel workers and coal miners.

He discusses, in detail, the first group of affections, that of nystagmus in miners, which, as he showed long ago, is mainly due to the constrained position in which the men work, and resulting strain and exhaustion of the elevator muscles of the eye. Illumination is a secondary factor. Nystagmus is found with all kinds of illumination underground, where electric light and oil lamps affording abundant light are installed, as well as in various occupations above ground, where there is constant strain of the elevator muscles, but ample illumination, either natural or artificial. Snell then takes up a new and important subject in this relation, namely, the effect of nystagmus on vision of miners and the degree to which it may interfere with the recognition of certain visual danger signals commonly used in mines. The detection of fire damp is of vital concern, and the ordinary method is by reducing the size of the oil flame of the safety lamp until the luminosity almost disappears and the fire damp then, if present, appears as a pale blue flame or cap above it, this "cap" being due to the presence of gas in the air, and in size, proportional to its amount. Apparent dancing of the flame of the safety lamp forms a prominent symptom of miners' nystagmus, and Snell has long suspected that this would be a hindrance to the delicate detection of the "cap." He made careful tests of a large number of miners with nystagmus as to their ability to recognize the gas cap over the flame of a safety lamp. The patient was allowed to remain in a perfectly dark room with only a safety lamp as a light. After "getting his sight" by adaptation, a small gas cap was produced and increased until detected. The patients were also made to remain for some time in the constrained position usual during the work of undercutting or holding coal, and then to rise and look at the lamp held above the level of the eyes, as in examining for gas at the level of the roof of the workings. Forty-eight miners from thirteen different collieries were tested. All complained of apparent motion of the lamp, and none could detect a small danger cap. Staggering and dizziness were common symptoms. Vision improved in some cases on steadying the eyes and resting them by turning them directly downward. The majority could not even see a large cap. A miner with nystagmus cannot be relied on to see the danger signal. The oscillation of the eyeballs makes objects appear to dance, and the rate of motion is proportional to the oscillations. As the latter may be very rapid, up to 350 a minute, the result is a blur. The oscillations may be to and fro, rotatory, or combined. Snell has given a graphic representation of the effect of nystagmus on vision by means of photographs taken with the camera in rapid oscillating motion. The photographic plate was held to represent the oscillating eyeball, and was moved one-half inch each way at the rate of 150 to and fro movements in a minute. The blur of the flame is marked, and even a normal eye finds it almost impossible to detect a delicate gas cap.

Disease of the Accessory Sinuses as a Cause of Inflammations of the Eye and Paralysis of the Ocular Muscles. J. F. Shoemaker[1] believes that notwithstanding the abundance of articles written in this country and in Europe during the past few years setting forth the close relations between disease of these sinuses and affections of the eye, many ophthalmologists do not think of sinus diseases as a cause of inflammations of the eye and of muscular disturbances as frequently as it would be well to do.

He considers the anatomical relations of the accessory sinuses to the eye, quotes Onodi on this subject, and discusses the exact manner in which the ocular disturbance is brought about.

He quotes Fish's well-known views on the subject, gives examples of uveitis, iritis, choroiditis, due to sinus disease, and describes a case of his own in which choroiditis was

---

(1) Am. Jour. of Ophthalmology, July, 1908.

due to maxillary sinus disease, and another in which unilateral headache was caused by frontal sinusitis.

Next he reviews affections of the retina and optic nerve dependent upon sinus disease; also paralysis and paresis of the ocular muscles due to the same cause, giving the histories of two patients in whom sinus disease was responsible for ocular pareses.

He concludes with the following concerning the diagnosis of sinusitis: "In order to make a diagnosis of sinusitis it has been thought by some that two symptoms were necessarily present, viz., pain and purulent secretion in the nose. Pain is very likely to be present in the 'closed sinusitis,' that is, where the secretion of the sinuses does not drain away on account of the natural openings being occluded. It is this form that is particularly liable to produce eye complications, and while there is usually more or less pain present, it is often mild and in some cases entirely wanting. On the other hand it is precisely this class of cases that do not have much, if any, secretion in the nares, because it cannot escape from the sinuses through the closed openings. Where there is a good deal of purulent secretion in the nares, it is proof that the cavities are draining well and hence not so likely to produce complications. Engorgement of the turbinates, both middle and inferior, is very suggestive of sinusitis. Three important symptoms of 'closed sinusitis' are dizziness, pain, either dull or severe, and nasal congestion."

Isolated Paralysis of the Sixth Nerve. Two hundred and fifty cases of paralysis of the 6th nerve, with brief clinical histories, are reported by Koellner.[1] Among the causes are intoxications, alcohol, lead, drugs (anthelmintics, but it could not be ascertained which), stovain, tropacocain, novocain in lumbar anesthesia; infections, malaria, influenza, erysipelas of the face; diseases of the kidneys, albuminuria, diabetes; disturbances of circulation, as arteriosclerosis leading to hemorrhages, military aneurisms and foci of softening in the nucleus, sclerotic changes of the internal carotid, which crosses the abducens twice; diseases of the central nervous system; lues of the brain, tabes, multiple sclerosis, polioencephalitis, chronic progressive

---

(1) Deutsche med. Woch., p. 112, 1908.

ophthalmoplegia, cerebral tumors, myasthenia gravis pseudoparalytica, hysteria, hemicrania; vasomotor disturbances; traumatic, octogenous (the exact cause in the 4 cases reported could not be ascertained), congenital palsies, and paralysis without ascertainable cause.

The isolated paralysis of the abducens was most frequently observed if toxic substances invaded the organism, either chemicals or from infectious diseases, or in disturbances of circulation. Both lead to changes of the vascular walls, with subsequent motor derangements of the ocular muscles, chiefly the abducens, owing to its long course through the cavernous sinus. The isolated palsy is either nuclear or basal, especially in injuries of the apex of the pyramid of the petrous bone. It must also be remembered that the 6th nerve crosses the posterior inferior cerebellar, the auditive, and internal carotid arteries. If damaged at its exit from the brain, it generally is associated with focal symptoms of other nerves. Each isolated palsy of the abducens calls for repeated careful examinations of the whole nervous system. Although the prognosis of infectious and toxic palsies is on the whole favorable, it may be the precursor of a commencing nervous trouble, e. g., in tabes paralysis of the abducens with and without iridoplegia may be the only affection of a cranial nerve. Koellner's cases show that in a great number of isolated palsies of the abducens other, even slight, disturbances of the remaining nerves may be of diagnostic value with regard to etiology. The frequency of the various etiological factors is illustrated by the following table:

	Isolated paralysis of the abducens.	Isolated paralysis of the abducens with simultaneous affections of the choroid and retina.	Paralysis of the abducens combined with other ocular palsies.
Chronic alcoholism	3	..	3
Intoxication by lead	2	..	..
Intoxication by other drugs	1	..	..
Malaria	1	..	..
Influenza (acute neuritis)	4	..	..
Erysipelas	1	..	..
Nephritis	5	1	4
Diabetes	1	..	..
Diseases of the circulatory system	4	..	1
Chronic meningitis	2	..	6

Acquired lues	14	1	25
Hereditary lues	..	2	..
Tabes	11	..	59
Paralytic dementia	..	..	1
Multiple sclerosis	2	..	5
Polioencephalitis	..	..	2
Chronic progressive ophthalmoplegia	..	..	1
Myasthenia gravis	..	..	6
Hysteria	3	..	..
Hemicrania	4	..	..
Vasomotor disturbances	4	..	..
Traumatism	6	..	7
Lumbar anesthesia	1	..	2
Diseases of the ear	2	..	13
Tumors of the brain	..	..	..
Without definite diagnosis	32	..	8
	103	4	143

Incomplete Congenital Ophthalmoplegia Externa. Sydney Stephenson[1] reports the case of a Jewish boy of 8 years who gave a history of never having been able to open his eyes, and that the condition became worse toward night fall. No family history of a similar defect could be detected. The child was born at term, was delivered with instruments, the scalp being wounded during the operation. The action of the iris is normal and accommodation is normal. The eyes have a movement of 2 mm. in all directions and more than this downward; slight coloboma of both optic discs. The 2d, 3d, 4th and 6th cranial nerves alone were involved. The author discusses the question of causation at considerable length, and concludes with the statement that he is inclined to attribute most cases of congenital ophthalmoplegia to an affection of the nuclear centers which govern the defective movements.

The Operative Treatment of Concomitant Squint. A critical review of the treatment of concomitant squint, based on his experience of 28 years, is published by Kuhnt.[2] If the deviation is less than 15°, nonoperative measures are adopted. If not successful, or in deviations of from 15° to 25°, the operation is indicated. The angle of deviation, the field of fixation, the limits of motility, the binocular field of vision and possible diplopia are tested by repeated examinations. Kuhnt is opposed to simple tenotomy, and has devised a graduated tenotomy which he describes. The advancement of the antagonist, with or without that of Tenon's capsule, is his favorite operation. Kuhnt de-

---

(1) The Ophthalmoscope, September, 1908.
(2) Zeitschr. f. Augenheilk., p. 231, 1908.

scribes his modification of advancement. If this is not sufficient, the graduated tenotomy is added.

Injection of Alcohol in Blepharospasm and Painful Tic Valude[1] reports 3 more cases successfully treated by this method, to which attention has been several times called in these abstracts. He infers from the result in one of these cases that the injection of alcohol is applicable not only to simple blepharospasm, but to so-called tic douloureux.

[Hugh Patrick, of Chicago, has recently reported many cases of painful tic and other forms of facial neuralgia cured by the injection of alcohol along the nerve, and it would seem as if the ophthalmic surgeon should bear this in mind in the treatment of similar conditions about the eye.—Ed.]

THE ORBIT.

Pistol Wound of the Orbital Contents. Newolina[2] reports an interesting case in a man, aged 44. There was instantaneous blindness without ophthalmoscopic changes, which gradually developed into atrophy of the optic nerve and narrowing of the blood vessels. From the symptoms and Roentgen photographs, the shot apparently entered the orbit between its inner wall and the eyeball to the superior orbital fissure, along the osseous septum between this and the optic foramen, the cavernous sinus, above the Gasserian ganglion to the upper face of the temporal pyramid, where it became lodged. It injured the optic nerve, most likely the upper portion, in its avascular part, the ophthalmic branch of the fifth nerve, grazed its ciliary twigs, and contused the oculomotor and trochlear nerves.

[In a case of attempted suicide, under my care some time ago, the bullet passed through the orbit into the nose without direct injury to the optic nerve, yet the patient became totally blind, thus confirming the suspicion of many observers that molecular changes within the nerve tissues may take place without actual contact with the missle. —Ed.]

Paraffin Spheres in Tenon's Capsule. A very instructive

---

(1) Annales d'Oculistique, April, 1908.
(2) Beitrage zur Augenheilk., p. 584, 1908.

and practical article by Chas. N. Pratt[1] deals with this important substitute for simple enucleation. Paraffin, with a melting point of about 60° C., is filtered through ordinary filter paper into large test tubes. These are sterilized by steam under pressure. When the tubes are cool, the glass is heated so that the paraffin can be removed as a solid rod. This is placed in a warm bichlorid solution and then cut into pieces and rolled into spheres about 2 cm. in diameter. To prevent contamination, rubber gloves should be worn while handling the paraffin. The spheres are preserved in a weak solution of bichlorid.

The operation Pratt advises is done as follows: The patient, being under general anesthetic, the skin about the eye and face is cleaned with soap and water, followed by alcohol, ether and bichlorid solution. The conjunctival sac is flushed with bichlorid (1-5000). A double layer of gauze, with an opening over the eye to be operated on, is placed over the face and ether cone. This prevents the sutures and the hands of the operator coming in contact with the ether inhaler, and aids materially in maintaining a clean field of operation. Aseptic precautions should be carefully observed, as an infection is sure to be, followed by failure. The conjunctiva is divided close to the limbus and dissected backward beyond the insertion of the recti muscles. These are picked up on a strabismus hook and separated from the surrounding tissue. Before dividing the tendons from their insertion in the sclera, each is caught by a small clamp. The writer uses 4 Halsted hemostats, known as the "mosquito" pattern. These prevent retraction of the muscles and the possibility of losing them. After dividing the tendons close to their insertions, the globe is enucleated in the usual manner. A paraffin ball is then dipped in sterile water to remove the bichlorid and cut, if necessary, to the proper size. The ball is seized with a pair of ordinary forceps and placed in Tenon's capsule. An elaborate introducer is entirely unnecessary.

The superior rectus is sutured to the inferior by a mattress or "U" suture and the two lateral recti in a similar manner. A slender, full-curve needle threaded with No. 00 chromocized catgut should be used. Large needles tear the

---

(1) Ophthalmology, January, 1908.

tendon unnecessarily and the plain catgut is too rapidly absorbed. To prevent the muscle loops from slipping back over the ball and to give a common point of insertion, an additional suture is placed so as to include each muscle at the crossing of the two loops. Tenon's capsule is closed by a catgut pursestring suture. This relieves the tension of the muscle sutures, covers the ball with an extra layer of tissue, and prevents the latter from slipping out between the muscles. The conjunctiva is then closed with a pursestring, making, in all, 3 layers.

Care must be taken during the operation not to puncture the tendons unnecessarily, as each needle puncture causes the fibers to separate and a possible cutting through of the sutures. In the adult a ball 2 cm. in diameter will be found the most suitable size. After the enucleation the hemorrhage may be rather free, but the insertion of the paraffin checks this. No irrigation is used during the operation. A firm gauze dressing is placed over the eye. This is changed daily for the next 4 or 5 days and then discontinued. The pressure bandage has been found to lessen the subsequent chemosis. The reaction following the operation is about the same as after an evisceration. Chemosis, as a rule, lasts about a week, but may in exceptional cases continue longer. One patient was discharged from the hospital with no chemosis on the fifth day.

The advantages claimed by the writer for the paraffin spheres over those of glass, metal, etc., are: 1. The spheres are easily made and are inexpensive. 2. Are not likely to be broken as are those of glass. 3. Paraffin causes less irritation than any other material; therefore, is less likely to be extruded. 4. Paraffin is soon surrounded by a fibrous capsule, and is firmly held in place by connective tissue downgrowths.

An inquiry into the causes of failure of the paraffin to remain in Tenon's capsule suggests the following:

1. The use of the prosthesis in cases not suitable, as in panophthalmitis or infected wounds.

2. The use of too large a ball, thus causing too much tension on the sutures. In a phthisis bulbi or in a child, a small sphere must be substituted for the globe.

3. Improper closure of the wound, thus leaving space for the globe to come out.

4. In cutting the optic nerve, the tissue in the back part of the orbit may be injured, thus allowing paraffin to work its way backward, as is probable in the case reported by Dr. Davis.

5. The use of soft paraffin. This will become warm and have a tendency to change its shape and wander about in the orbit.

6. Lack of asepsis, either in preparing the sphere or during the operation. The face and field of operation must be well covered by gauze, as the contact of the sutures with the skin, hair, or ether cone may spoil the effect of the operation.

Anesthesia of the Orbit in Ophthalmic Surgery. The sensitive nerves of the eyeball are, as is well known, the long ciliary nerves from the nasociliary nerve and the short ciliary nerves from the ciliary ganglion. The long ciliary nerves arise from the nasociliary nerve shortly after the long root to the ciliary ganglion has branched off. Thus the sensitive nerves of the eyeball are gathered at a point near the ciliary ganglion. An injection, directed toward the ciliary ganglion, influences, says Loewenstein,[1] all sensitive nerves of the eyeball. Guided by preliminary anatomical studies, Elschnig performed 26 operations with ganglion anesthesia, viz., 18 enucleations, 7 extenterations and 1 cyclodialysis.

After *cocainization of the conjunctiva a Pravaz's syringeful of a 1 per cent. solution of cocain is injected through a strong needle 5 cm. long.* The lateral commissure is stretched toward the temple and the needle introduced through the conjunctiva, close to the lateral orbital margin a little below its middle point, along the lower border of the external rectus muscle and the lateral orbital wall, and finally lifted inward until about 0.5 cm. of its shaft is still visible, and one-half syringeful injected. By slight lever motions one must guard against the needle being caught in the optic nerve or a larger blood vessel. Then the anesthesia of the eyeball, which ought to be established within 2 minutes, is tested by slight pressure on the globe.

---

(1) Klin. Monatsbl. f. Augenheilk., p. 592, 1908.

If this is not anesthetic the needle is pulled back about 1 cm. and protruded in a changed direction. If no pain is felt, subconjunctival injections of cocain, about 15 mm. from the limbus, are made in inflammatory cases. Most patients were given 0.01 morphin half an hour previously, which had a beneficial psychical effect. In non- or slightly inflamed eyeballs the pain was equal to nought, but also in most cases of inflamed eyeballs (in 11 out of 13) complete anesthesia was attained. In none of the cases was a bad effect of cocain observed.

GLAUCOMA.

Pathologic Excavation of the Optic Nerve. Schnabel[1] states briefly his views on this subject: Out of the many thousand cases of atrophy of the optic nerve seen by him, which had no glaucoma, not one showed an ophthalmoscopically noticeable pathologic excavation. Every pathologic excavation which is seen ophthalmoscopically is glaucomatous. In many optic nerves with glaucomatous excavations, examined ophthalmoscopically or anatomically, or both, by Schnabel, the lamina cribrosa was in its normal position. The pressure excavation is only imaginary. The only actually existing pathologic excavation, the glaucomatous excavation, is produced by a special form of disappearance of nerve fibers, and therefore is an atrophic excavation.

Glaucoma as a Sequel to Leucoma Adherens. It is well known that the increased tension is not an unusual sequel to the production of anterior synechiæ or leucoma adherens, and that this sign results from the obliteration of the angle of the anterior chamber. Fuchs[2] has endeavored to ascertain how the blocking of the angle is brought about and why increase in tension occurs in some cases and not in others apparently exactly similar. It appears that inflammation of the cornea causes a thickening or bulging inward of the pectinate ligament, which is met by a fold of swollen iris; the two adhere and form a ring-shaped canal, after the manner shown by Priestley Smith. This canal is liable

---

(1) Zeitschr. f. Augenheilk, p. 556, 1908.
(2) The Lancet, Aug. 8, 1908.

to complete obliteration or to be filled with lymph. If the cornea does not perforate, reformation of the angle is likely; but if it does perforate, the blockage is permanent, because the loss of aqueous brings the swollen iris into direct contact with the inflamed cornea, a contact that is effective by reason of the forward pressure of the inflamed ciliary processus and perhaps also of the contents of the posterior chamber. This application may proceed to adhesion, in which case the epithelium of the cornea and iris is lost and the surfaces unite, either directly, or by the interposition of a thin layer of new tissue.

Value of Treatment in Glaucoma Simplex. Von Hippel[1] does not believe in the miotic treatment of glaucoma simplex. He always does a free iridectomy and never has seen important impairment of the visual function as an immediate result. His statistics include 58 patients with 74 glaucomatous eyes observed over a period of 14 years. Considering those cases as cured that showed no deterioration at the end of at least 2 years, he has a per cent. of cures of 41. Of these there have been under treatment 12 from 2 to 5 years, 9 from 5 to 10 years, 6 from 10 to 14 years. These include some which had a marked contraction of the field and considerable excavation of the nerve head. As temporarily cured he includes 9 (14 per cent.); 6 from 1 to 2 years; 3 less than 1 year without loss of function. In 17 eyes (27 per cent.), in spite of iridectomy, there has been continued failure of vision, but not blindness; in 13 eyes (20 per cent.), blindness in from 1 to 5 years. Sclerotomy has given no permanent results, but has been of value in iridectomized eyes.

In discussion, Stilling said that he does not operate when the contraction has reached or approached close to fixation, having had unfavorable results at this stage. He attributes von Hippel's favorable results to the fact that at the clinic consent is obtained to operate at an earlier period than in private.

[Notwithstanding these observations of v. Hippel, the experience of Posey and others probably coincides more truly with the experiments of American ophthalmologists. There can be no doubt but that iridectomy in simple glau-

---

(1) Die Ophthal. Klinik, Sept. 5, 1907.

coma is as a rule a failure. It rarely checks the contraction of the visual fields or brings about a permanent improvement of central sight. Possibly the differences of opinion may result from the fact that eserin and other miotics are not used as thoroughly or as long as they ought to be. As Posey points out, the patient should have treatment as long as he lives or until the remedy ceases to produce any effect.—ED.]

Operations to Insure Filter-Cicatrices. Herbert[1] believes that much of the benefit of iridectomy is due to the formation of a cicatrix through healing of the sclerocorneal wound over entangled iris or otherwise. He thinks the value of iris-prolapse has not been fully appreciated. The iris-free filtering cicatrices have been formed by two methods and possibly two additional ones. LaGrange's operation has had the longest trial. The size of incision might be reduced in length, and a small basal iridectomy substituted for the large incision of iris now made. The question is whether the tension is not reduced too much in some cases. The author's operation gives perfect filtering scars, but he has not escaped an experience of both excessive and deficient reduction of tension. He believes greater uniformity of results obtainable by more care and attention to detail in operating.

[During the past 8 years I have been in the habit of doing an operation that closely resembles that of LaGrange and have been very well satisfied with it. Having seen in my own hands and as a result of the operations of others the quite slight results from the simple operation of iridectomy in subacute and chronic forms of glaucoma as contrasted with the brilliant and permanent effects produced by cystoid cicatrices, herniæ, fistulæ of the sclera following various operations for the relief of this disease, I have come to think that the operation of the iridectomy class is most valuable that provides for the escape of the intraocular fluids through a thin, scleral scar.—ED.]

Cyclodialysis and Its Influence on Increased Intraocular Tension. The operation of Heine is fully described by Meller.[2] After thorough cocainization the conjunctiva and

---

(1) The Ophthalmoscope, July, 1908.
(2) Graefe's Archiv, 67, 3, February, 1908.

capsule of Tenon are dissected up so that a small area of the sclera, *about 5 mm. from the corneal limbus,* is exposed. An incision is made through the sclera parallel to the margin of the cornea and preferably down and out and not longer than 2 mm. This incision is made with a lance knife, slowly and carefully without pressure, to avoid injury to the uvea. That the sclera has been penetrated can be told by the release of the resistance and the appearance of the uvea in the bottom of the wound and the fact that the slightest movement of the instrument on the ciliary body causes pain. During this procedure the eye is rotated strongly upward and fixed by forceps. Hemorrhage may be annoying and can be controlled by adrenalin. Should a ciliary vessel be cut it may be seared by the thermocautery. The second step consists in the introduction of an iris spatula into the wound and carrying it forward between the sclera and ciliary body. Difficulty in this maneuver may result from entanglement of the tip of the instrument in incompletely divided fibers of the sclera. The instrument is entered somewhat obliquely and as soon as it has passed through the sclera it is made parallel with the surface of the sclera and pushed on gently until its tip appears in the anterior chamber.

The third step consists in the separation of the ciliary body from the sclera. This is accomplished by giving to the spatula a side to side movement. The separation extending from the vertical meridian below to the horizontal meridian on the temporal side. The spatula must not be entered further into the anterior chamber than to permit of its tip being always visible. After the undermining is completed the spatula is brought back to its primary position and slowly withdrawn. No resistance is met with in undermining unless: (a) Scleral fibers arrest the point of the spatula. This will take place while the tip is still within 1 mm. of the opening. (b) By a nerve or blood vessel passing from the sclera to the ciliary body. All hemorrhage should have ceased before withdrawing the spatula lest the blood be sucked into the anterior chamber. A certain amount of hemorrhage is apt to follow so free a separation of the ciliary body and an attempt should be made to control it with the finger. After completion of the operation a pressure bandage should be applied for 8 hours. (c) Resistance can be felt when the spatula impinges upon the scleral insertion of the fibers of the ciliary muscle. (d) Resistance to the advance of the spatula through the penetration of its point between the membrane of Descemet and the corneal parenchyma. From this an opacity results which, however, slowly disappears. It is due to a swelling of the parenchyma itself. It appears to be a frequent complication of the operation. A fifth, but unimportant obstruction is the union of the root of the iris to the posterior surface of the cornea. This may lead to the production of an iridodialysis, but it will not have any sequelæ.

Two complications which, however, seldom occur, are: 1. Too rapid cutting through the sclerotic when that membrane is pathologically thin, and the incision placed too far from the limbus may cause a prolapse of the vitreous. 2. The operator, instead of keeping to the scleral wound, penetrates the uveal tract so that the spatula comes out behind the iris.

Injury to or luxation of the lens should not be possible. The full effects of the operation are reached gradually in from 1 to 3 days.

The effects may be divided into 3 groups: 1. Permanent unfavorable result. 2. Transient result. 3. No effect whatever.

In Meller's series 40 per cent. fell within the first group. This is in a measure explained by the character of the cases which at first were chosen for operation—absolute glaucomatous eyes. The second group contained 30 per cent. of the cases. In the third group were mostly cases of absolute glaucoma, in one instance glaucoma secondary to a choroidal sarcoma. This group contained about 30 per cent. The indications for the operation are primary as well as secondary glaucoma, except such cases of secondary glaucoma arising from seclusio pupilæ, iris bombé, etc. In adherent leucoma it is very serviceable. In dislocation of the lens the operation is strongly indicated.

It cannot be said that the operation of cyclodialysis will take the place of iridectomy, and that the presence of primary glaucoma calls for the performance of the operation. The real *indication for it is the impossibility of performing iridectomy from the presence of very high intraocular tension and absolute glaucoma which has progressed far.*

[The Editor is very favorably impressed by the results of this operation and from his own experience with it as well as from the results obtained by others, recommends it to his readers as a safe procedure if the foregoing precautions are observed.]

OCULAR INJURIES. SYMPATHETIC OPHTHALMIA.

Multiple Isolated Rupture of Descemet's Membrane from Injuries During Birth. Ruptures of Descemet's membrane have been described in various processes which produce increase of intraocular tension or stretching of the eyeball, as hydropththalmus, intraocular tumors, keratoconus, high myopia, peripheral ectasia of the cornea in gerontoxon and traumatism through the obstetrical forceps. Stock clinically assumed ruptures of Descemet's membrane in a newborn infant as a consequence of delivery with forceps. There was severe parenchymatous keratitis, which disappeared after 2 months, but typical keratoconus developed. Rupprecht[1] saw a slight diffuse parenchymatous haziness of the cornea with impressions above the eye of a newborn, delivered with forceps (narrow pelvis of the mother). Apparently the right blade of the forceps had been applied to the right eye. The child died the next day. Descemet's membrane presented two dehiscences, $\frac{1}{3}$ and $\frac{2}{3}$ mm. wide, and there were extensive hemorrhages between choroid and sclera, and within and in front of the retina. The forceps apparently had pressed the cornea into the interior of the eye like a rubber ball, causing ruptures of the now convex inner surface of Descemet's membrane.

E. von Hippel found in the eye of a newborn child small ruptures of Descemet's membrane and hemorrhages at the fovea and in the vitreous, which perhaps had also been produced by the forceps.

---

(1) Kl. Monatsbl. f. Augenheilk., p. 134, 1908,

John Green, Jr.,[1] notes as one of the most frequent forms of these traumatisms an *opacity of the cornea.* This may be diffuse and transitory, or of a linear or irregularly striped aspect, and permanent, depending on edema of the cornea due to tears of Descemet's membrane. Buchanan has suggested that unilateral high grade astigmatism may be traumatic in origin. Fracture of the frontal bone and orbital roof may be due to direct pressure by forceps. Exophthalmus may be caused by compression of the skull or by a direct backward pressure of forceps, acting like the speculum which dislocates the globe in enucleation. Subconjunctival extravasations are usually accompanied by other injuries, as are hemorrhages into the anterior chamber. Optic atrophy may follow fracture running through the optic foramen. The lids may be bruised, cut, or partially torn off; even the globe may be gouged out. Traumatic cataract, oculomotor palsy, iridodialysis, rupture of the choroid, deep intraocular hemorrhage, have also been noted, all after the use of forceps in delivery. Not over 25 per cent. of recorded cases can be classified as severe. Minute retinal hemorrhages are rather common. Many injuries are found to have occurred in noninstrumental delivery, as after version, in face presentations, spontaneous deliveries, breech presentations, and so on. Considering that it is frequently a question of losing or saving 2 lives, a possible injury to the child's eyes can hardly weigh as a serious contraindication to the use of forceps, but the grave possibilities should always be borne in mind. Any marks of violence to the eyes or ocular adnexa should lead to thorough examination.

Cheap Hammers as a Factor in Penetrating Wounds of the Eye. S. C. Ayres[2] has studied the character and condition of the tools used by mechanics and the manner in which penetrating wounds of the eye were received. He found that generally the injury was inflicted by fragments flying off while the mechanic was striking a chisel or a piece of metal or a hatchet with a hammer; that the hammer was usually a cheap one, and that the purchase of

---

(1) Interstate Med. Jour., April, 1908.
(2) Am. Jour. of Ophthal., May, 1908.

hammers of better quality would prevent such accidents to a considerable degree.

An all-steel hammer costs about $1.25. The kind usually purchased costs about 35 cents and is made from a low carbon tool steel the outside of which is hardened or tempered to the extent of about a sixteenth of an inch; the metal beneath the outside casing is soft and porous; repeated blows on the face of this hammer drive away this softer metal from the outside shell, thus leaving a space and allowing the shell to crack and chip off from the edge of the hammer face.

A Piece of Steel Weighing Less Than a Milligram Removed from the Vitreous with Normal Vision. Spratt[1] gives the following account of an interesting case. A machinist was struck in the eye by a particle from a cold chisel. Eight days later he consulted an ophthalmologist, who made an unsuccessful attempt to remove the foreign body with a giant magnet. Two days later the author was consulted, who, after locating the foreign body by Hulen's method, successfully extracted it through an incision in the sclera 14 mm. behind the temporal corneal margin At the time of the operation there was pus in the anterior chamber and cloudy vitreous. Three months later the eye had vision of 6/v. The ophthalmoscope showed a yellowish spindle-shaped scar posterior to the macula and a little below a crescent-shaped area in the retina caused by the steel. The author recommends, in all cases, that the situation of the foreign body be accurately determined, and that an incision be made at the nearest point in the sclera, through which the foreign body is to be removed with the tip of a powerful hand magnet.

A Piece of Steel in the Eye Seventeen Years. Dickey[1] reports a case in which the patient had been injured in the eye by a piece of steel 17 years previous to the time when the writer was consulted. The eyeball showed signs of degeneration and was painful and inflamed. Enucleation was done and the eyeball found firmly attached to the orbital tissue, in the region of the optic nerve, by dense bands of adhesions. A piece of steel, the size of a buck-

---

(1) Ophthalmic Record, September, 1908.
(2) West Va Med. Jour., July, 1908.

shot, was found lying on the floor of the eyeball in the lower anterior quadrant.

Localization of Foreign Bodies in the Eye. Bowen[1] has modified the Sweet apparatus so that the patient may lie down, the head being firmly held with sand bags, a compression diaphragm being used, and the plates changed without disturbing the apparatus. The balls of the Sweet localizer are so arranged that they can be raised and lowered on an upright post which is attached to a lead weight. The diaphragm of the compression cylinder is placed above the head in such a way that the light from the tube is thrown through the head directly over the two balls. After the first exposure the cylinder is moved about 3 inches toward the patient's body, and tilted so that the light will again pass through the balls. Plotting is done on the usual chart, ruled in the millimetre scale. For locating pieces of steel, a tube of high penetration is used. In cases of suspected glass in the eye, where the x-ray examination gives a negative result, the technic is checked by placing small fragments of the same kind of glass to the side of the eye and making a second exposure. If these test pieces show, and the first set of pictures shows nothing, we are sure that no glass is present.

The Defects of the Giant Magnet in Diagnosis. Asmus[2] thinks that although the general introduction of the giant magnet is to be hailed as a therapeutic progress, its use for diagnostic purposes is to be regretted. Forty-three of his patients felt pain when the giant magnet was employed, while 14 showed not the least reaction. Therefore a negative reaction to the giant magnet does not indicate that there is no foreign body in the eye. In all these 14 cases Asmus' sideroscope revealed distinctly the presence of iron, which was extracted.

One tragic case is reported in detail, in which Roentgen rays, giant magnet and sideroscope in a large clinic gave negative results. After a year, when the patient came to Asmus, vision was reduced to 6/xxiv. Asmus located the seat of the piece of iron with his sideroscope and extracted it.

---

(1) Am. Quarterly Journal of Roentgenology, Vol 1, No. 4, 1907.
(2) Klin. Monatsbl. f Augenheilk., 1908, p. 262.

In order to obtain *reliable registrations of the sideroscope,* the following directions must be observed: The apparatus must be properly arranged. The magnetic needle must always be hung free. It must be magnetized every year. The foreign body must be made magnetic. The cocainized eye should be skilfully approached to the glass tube of the needle. For localization of intensely magnetic pieces the damping needle must be employed. If maximal deviation is lacking, the examination must be made with the telescope.

The device of Koster to obviate the disturbing influence of electric street railways on the magnetic needle of the sideroscope is endorsed as a correct solution of this difficulty. Asmus considers the sideroscope, kept in good order, indispensable for the diagnosis of the presence of iron hidden in the interior of the eye.

Diagnosis of Intraocular Pieces of Iron. Sideroscopy, according to Jung,[1] requires a great deal of patience and is subject to certain sources of error which, if ignored, may lead to wrong diagnoses. This fact he illustrates by 2 cases. In the first, a piece of iron, lodged in the cheek from a former injury, caused a misleading reaction of the sideroscope, but was detected by Roentgen rays. In the second case, the sideroscope indicated that a large foreign body in the eye, disclosed by Roentgen rays, must be iron, whereas all attempts to extract it with giant and hand magnets failed. The eye was later on enucleated on account of cyclitis, and the foreign body proved to be an alloy of copper and zinc, which frequently contains iron.

Jung shows the great value of the sideroscope in cases in which the giant magnet failed, for giving the negative proof that no iron is in the eye. The most dangerous cases in that respect are those in which the foreign body enters laterally through the sclera and which do not at once come under treatment. Jung saw 5 cases of blindness from siderosis in which the foreign body had been overlooked. This would have been avoided if sideroscopy had been employed, which afterward yielded maximal deviations. If the registrations of the sideroscope are too indefinite, the Roentgen rays must be resorted to.

---

(1) Klin. Monatsbl. f. Augenheilk, p. 271, 1908.

Pleas for a More Favorable Prognosis in Penetrating Wounds of the Eyeball are made by Donovan,[1] who claims that enucleation is performed too frequently and without sufficient deliberation. The fact that injuries of the eye are frequent in lower animals while sympathetic opththalmia is unknown proves that many cases could be treated expectantly without danger. Many eyes are lost through meddlesome surgery. Donovan suggests the following routine:

Mild antiseptic cleansing with 1-5000 iodid, 1-2000 cyanid, or 1-5000 bichlorid of mercury, or with saturated boric acid solution. Argyrol in special cases.

Remove all magnetic foreign bodies at once; also any that can be removed more easily and safely than later on. Those remaining to be removed from time to time when the eye can most safely stand interference.

Enucleate at once only such eyes as have been totally destroyed, waiting until fourth day to make sure. Others should be cleaned, filled with salt solution if collapsed; prolapsed iris replaced or cut off.

Cauterize infected wounds; stitch when lids will not hold edges in apposition; atropin and dionin as indicated. Hot applications are always safe and usually preferable to cold.

Keep the patient in bed a few days longer, if possible, as detachment of retina may have occurred. Finally, never interfere with an eye until you feel reasonably certain you are now doing the best thing, and at the best time; otherwise always wait. In the discussion attention was called to the danger of delaying enucleation in hopelessly injured eyes, the importance of early enucleation in preventing sympathetic inflammation, which is a disease limited to man, the possibility of its developing within a few hours after injury to the fellow eye

The Protective Influence Exerted by the Iris in Wounds of the Cornea. Traumatisms of the cornea are frequently of an infective nature, be it a perforated ulcer or a perforation due to the entrance of a foreign body. Tooke[2] reminds us that by walling off the infected sides of the

---

(1) Jour. Am. Med. Assoc., July 25, 1908.
(2) Ophthalmic Record, August, 1908.

incision, an effort is made to ward off the entrance of bacteria into the anterior chamber and to avoid subsequent panophthalmitis. Beyond this purely mechanical action the blood vessels of the iris assist in carrying off the localized infection to the general circulation, thus preventing subsequent necrosis of the cornea. A second feature, noted by the presentation of the iris, is that the process of actual healing .or of granulation tissue formation is materially assisted; that after draining away the infective agencies the number of leucocytes supplied by the blood vessels of the iris readily assist in the formation of new connective tissue elements. This tends to permanently close the perforation, and allows the reformation of the protective epithelial strata of the cornea. Besides completely filling the gap in the cornea and preventing any escape of the aqueous humor, the anterior chamber is restored and the intraocular circulation reestablished.

It cannot be denied that many lamentable results are avoidable by performing an iridectomy or by releasing the anterior synechia. The author does not advocate Nature's method as being superior to surgical interference, but presents it as the means Nature adopts for closing an infected hole in the cornea in a most effectual manner.

Tetanus After Injury of the Eye. Wicherkiewicz[1] could find only 3 observations of this infection in literature. He observed the following case in June, 1903: The right lower lid of a boy, aged 15, was injured by the point of a stick. Three days later a contused wound of the skin, 2 cm. long, with purulent discharge, was seen at the lower orbital margin. Lower lid and cheek were swollen. The wound was carefully washed with a solution of boric acid, painted with 10 per cent. ichthyol salve, and covered with paper dressing. The next day trismus set in, and the patient was transferred to the department of infectious diseases, where a subcutaneous injection of 20 c.c. tetanus serum was made. The attacks of trismus, however, grew more violent and almost constant, in spite of injections of morphin and chloral hydrate. Two further subcutaneous and intravenous injections did not save the patient from death.

---

(1) Abstract in Ophthalmology, April, 1908.

Diplopia Due to Head Injuries. Elze[1] details 2 cases illustrative of this important condition. In the first case, 6 months before the examination there had been concussion of the brain, with symptoms indicating labyrinthine disease and involvement of the semicircular canal on the left side. The subjective symptoms were diplopia and tinnitus. There was homonymous diplopia in all directions, with no change in the relative distance of the 2 images. The fundi were normal except for a slight pallor of the left optic nerve (not atrophied). Color perception was somewhat subnormal.

In the second case the history and symptoms were similar. No spontaneous diplopia, but with Maddox rod and double images close together, widening on lateral deviation to the right or left.

That the ocular disturbance is due to changes in the semicircular canal and not to labyrinthine disease is shown in a case reported by the author, in which the auditory nerve was greatly damaged in its peripheral distribution and was not accompanied by any ocular symptoms.

[Within the past 6 months I have had 2 cases of *diplopia following head injuries* without evident traumatism in or about the orbital region. In 1 instance the patient fell from a second story window to the pavement below. He was unconscious for 3 days and on awakening noticed that he could not see as well as before. Central vision was affected about equally in each eye, being two-thirds of normal, with ability to read Jaeger 8 only. Before the accident he had been able to read fine print. No glass helped his vision, but in the course of a month his sight improved both for distance and near. The double vision persisted and examinations disclosed a paresis of the external rectus.

In the second case the patient had an almost complete unilateral third nerve paralysis following a blow upon the back of the head. In this instance, also, vision deteriorated after the injury but slowly improved, but the double vision has persisted, although after 6 months it has slightly improved.—ED.]

---

(1) Wochenschr. f. Therapie des Auges, Oct. 1, 1908.

Sympathetic Ophthalmia. Brose[1] warns general practitioners against mistaking simple sympathetic irritation for sympathetic ophthalmia. *Sympathetic irritation* is characterized by photophobia, blepharospasm, increased flow of tears, injection of the blood vessels in front of the eyeball, accommodative asthenopia, neuralgic pain in the distribution of the supraorbital nerve, with at times retinal asthenopia and contraction of the field of vision. It is not only a frequent accompaniment of sympathetic ophthalmia, but it is likewise a prodromal symptom of much value in arriving at an early diagnosis of it. Three clinical types of the disease are described: (1) Iridocyclitis of a proliferative and adhesive nature; (2) serous iritis, characterized by slight pericorneal redness, turbidity of the aqueous humor and anterior portion of the vitreous, deepening of the anterior chamber, with punctate dot-like deposits triangularly arranged upon the posterior surface of the cornea; (3) papilla retinitis, in which the outlines of the optic disc are obscured, with edema of the adjacent retina. This type is rare. The onset may be so insidious that the eye may become blind with but little suffering. The author records 3 cases. He believes that a toxin forms in the injured eye and makes its way to the sympathizing eye either through the blood vessels or the lymphatics. As to prophylactic enucleation, the author states the rules laid down by de Schweinitz. He urges strongly not to enucleate the injured eye so long as it retains vision, as it may possibly prove the more useful of the two eyes He recommends confinement to a darkened room, atropia instillations as long as the pupil will react to a mydriatic, hot compresses, inunctions of mercury, aspirin and salicylate of soda. For the relief of intraocular tension dionin may be used with morphia hypodermically. A sclerotomy might be advisable.

Sympathetic Ophthalmia After Ablation of the Anterior Segment of the Eye. A chronic cyclitis had followed an unsuccessful operation for complicated cataract of the right eye 2 years before the patient was seen by Trousseau,[2] and later an abscission had been performed.

---

(1) The Lancet-Clinic, July 18, 1908.
(2) Annales de'Oculistique, July, 1908.

Seven weeks after this last operation the left eye was weak and watering and vision was so much impaired that the patient had difficulty in going about. The eye was congested, there was pericorneal injection, the iris was changed in color and adherent in places, there were points of exudation on the membrane of Descemet, and the vitreous was hazy. The stump of the right eye was injected and tender to pressure.

The stump was enucleated and atropia, mercurial inunction and laxatives were ordered. The symptoms improved and the patient was finally discharged with vision equal to one-third.

Trousseau considers it indisputable that when sympathetic ophthalmia has commenced nothing should be done to the sympathizing (injured) eye but to remove it. Any other intervention promotes sympathetic ophthalmia. He has known of cases in which resection of the optic nerve, the use of the galvanocautery, iridectomy, the removal of a foreign body and abscission have had this effect.

The Time for Enucleation in Sympathetic Ophthalmia. Valude[1] advocates a prudent medium between the abuse of enucleation and the dangerous conservatism which tends to result from the reaction against it. He thinks it good surgery to sacrifice eyes in which vision is manifestly lost, particularly if they contain foreign bodies. It can no longer be denied that when enucleation is performed, even at the earliest appearance of the slightest subjective symptom of sympathetic affection, it may be and nearly always is, already too late.

The only point worthy of discussion now is what procedure it is best to follow in cases in which sympathetic trouble is threatened when the injured eye is still capable of useful vision.

It is not possible, of course, to prescribe a formula for all cases. As Coppez has said: "To enucleate an 'exciting' (injured) eye still capable of vision when we are not sure of preserving the vision of the other (sympathizing) is assuming a grave responsibility."

After reporting a case in illustration of the fact that enucleation is of but little benefit when sympathetic oph-

---

(1) Annales d'Oculistique, June, 1908.

thalmia is once established, the author concludes that it is better to sacrifice a useless eye before the first signs of sympathetic inflammation appear, when it may be too late, though, even then it is well to enucleate. He believes though that an injured eye still capable of vision should be retained when the other is involved, in view of the uncertain effects of enucleation after sympathetic ophthalmia is once established.

OCULAR SYMPTOMS IN GENERAL DISEASES.

Relation of the So-Called Ophthalmic Migraine to Epilepsy. Hubbell[1] believes that these affections are two distinct forms of neurosis, and doubts that a genuine transformation of one into the other ever takes place, although Gowers, Charcot and others claim that they are related, and Spiller has recently reported 2 cases in which he finds a connecting link in transitory paresis, paresthesia and disturbances of speech. These supposed "connecting link symptoms" are not essential to true epilepsy, and not necessarily forerunners or concomitants of it. The great disproportion in frequency between the 2 neuroses also speaks against this theory. Migraine is common, epilepsy rare; and while transitory paresis and paresthesia are frequently noted in the former, there are thousands in whom these symptoms never develop into epilepsy and in whom there is no family history of the disease. The two affections may, of course, occur in the same individual, but the attacks are entirely separate and independent. The clinical picture may be modified, both as to migraine and to epilepsy, by the association, but this proves neither kinship nor transformation. Of late years Gowers seems to have come to a similar conclusion.

Optic Neuritis in Multiple Sclerosis. Recently more attention has been devoted to the relatively frequent occurrence of optic neuritis and acute retrobular neuritis in disseminated sclerosis. Either of them is of great value for the early diagnosis of multiple sclerosis, as it is sometimes

---

(1) Jour. Am. Med. Assoc., Aug. 8, 1908.

the only symptom which may precede those of the brain and spinal cord for a long time.

Of 4 cases reported by Bagh,[1] optic neuritis preceded general affection in 1 case 10 years. In all the visual disturbances set in suddenly, but soon an improvement took place. The futility and fluctuations of the whole clinical aspect, especially of vision and visual field, were also very characteristic. In disseminated sclerosis vision may be abolished in a very short time, but the prognosis is favorable and the sight may be completely or partially restored. Further statistics are required as to the frequency of optic or retrobulbar neuritis in multiple sclerosis. While Fleischer assumed 90 per cent., the observations from Schoeler's clinic yielded only 16 per cent. as far as retrobulbar nueritis, not caused by intoxications, was concerned. Bagh thinks that this percentage is too low.

Retinal Hemorrhages in Anteriosclerosis. Straub[2] reports the course of 15 cases of retinal hemorrhages from arteriosclerosis after 5 years.

The hemorrhages were mostly attributed to thrombosis of the retinal veins. The ophthalmoscopic changes of the arteries and the further course proved the existence of arteriosclerosis. The disease of the veins is, according to the investigations of Harms, a consequence of general arteriosclerosis, although this may not be apparent clinically or cause general symptoms. Three of the cases were women. In 5 cases both eyes were affected. The hemorrhages occurred most frequently at the ages of from 45 to 65 years, viz., 9, of which 5 had died from apoplexy, 2 after 2 years, 1 after 3, 2 after 2 years, 1 aged 53, after 3 days. All cases belonged to the better classes, and had felt perfectly well, urine was free from albumin and sugar. The prognosis as to life was not bad in the youngest and oldest persons, while the affection of the retinal vessels at the intermediate ages gives a very bad prognosis.

Straub reports 2 cases, in each of which one eye had been removed on account of glaucoma. In the first case slight hemorrhages were observed in the second eye and an antiglaucomatous treatment with pilocarpin was or-

---

(1) Klin. Monatsbl. f. Augenheilk., p. 10, 1908.
(2) Klin. Monatsbl. f. Augenheilk, p. 517, 1908.

dered, under which the hemorrhages, which had continued for 2 years, gradually ceased. In the second case the hemorrhages disappeared entirely one year after iridectomy. Straub thinks that the antiglaucomatous therapy in these cases perhaps promoted healing.

Probable Tumor of the Pituitary Body Without Giantism but Exhibiting a Binasal Hemiopia. A woman of 39 years, in apparent good health, complained to Casey Wood[1] first of dimness of vision at the near point with a sense of strain. Later she noticed that she could see better by turning her head to one side. She wore her hyperopic correction of 1.25 with some relief. Her vision is 1/x in O. D. and 1/v in O. S. Pupillary reaction and tension normal, shows a diffuse gray-white decoloration of both optic nerves. The fields of vision for white and colors show heteronymous hemiopia.

A skiagram showed an enlargement of the *sella tursica,* with a faint shadow that represents an enlarged hypophysis. Her blood count shows red corpuscles 4,250,000; white corpuscles 9,600. She has no symptoms of acromegaly or myxedema. A month after the first examination she was examined again, when it was found that the visual fields and vision had slightly improved.

Ocular Complications of Pregnancy. Aside from temporary functional derangement, hysterical or neurotic manifestations, and general disturbance of metabolism with consecutive ocular disease, Hiram Woods[2] maintains that there are 4 important classes: uremic amaurosis, loss of central or peripheral vision without retinal lesion due to retrobulbar neuritis, albuminuric retinitis, and a specific form of neuroretinitis with hemorrhage and exudate. There is doubt whether the term "uremic" should be applied to blindness occurring in eclampsia, as the element of acid intoxication may be due to faulty metabolism dependent on intestinal, hepatic or other disturbance. This also holds true of the renal origin of "albuminuric" retinitis in pregnancy.

Ocular Symptoms and Diseases Accompanying Adenoids. A certain number of ocular symptoms and diseases occur

---

(1) Ophthalmic Record, March, 1908.
(2) Jour. Am. Med. Assoc., July 18, 1908.

with sufficient frequency in children who have adenoids to warrant the assumption of a relationship between the nasopharyngeal and the ocular conditions. These anomalies, May[1] remarks, consist of epiphora, blepharitis, catarrhal, and more rarely purulent, dacryocystitis, congestion of the conjunctiva, phlyctenular conjunctivitis and keratitis, subacute and chronic conjunctivitis, certain forms of conjunctivitis bordering on the trachoma type, and true trachoma. None of these ocular symptoms and affections can be properly considered as due entirely to the existence of adenoids, since they are all found in children who are free from the latter; but they frequently accompany the adenoids; the existence of the nasopharyngeal condition aggravates the ocular anomaly, and the removal of the adenoids causes a disappearance of the ocular affection in some cases, and in others makes the cure less difficult.

The adenoids should be regarded as a predisposing factor rather than as a direct cause. If we stop to consider the congestion of the nasal mucous membrane and the consequent catarrhal inflammation of this membrane produced by the adenoids, we will readily understand how, in the same manner, the neighboring conjunctiva will become congested and be disposed to catarrhal inflammation. Not only is there apt to be congestion, but the catarrhal inflammation travels up the lacrimal duct and thus infects the conjunctiva by contiguity.

Epiphora, or excessive lacrimation, is frequently seen in children affected with this condition, and very often without any change in the conjunctiva or in the lacrimal sac or duct except congestion. Such epiphora is not infrequently an annoying symptom in infants, and where there is an absence of visible change in the conjunctiva, and the lacrimal sac seems normal, adenoids should be thought of. The blepharitis, catarrhal conjunctivitis, dacryocystitis, and the phlyctenular affections can be explained in the same manner—the local predisposition is produced by the congested conjunctiva. There is one form of conjunctivitis which is particularly prevalent in children affected with adenoids; this is the variety about which at present there is a great deal of controversy as to whether such cases

---

(1) Arch. of Pediatrics, January, 1908.

are instances of real trachoma, or are examples of subacute conjunctivitis with follicular hypertrophy.

Diagnosis of Exophthalmic Goiter. Jackson and Mead[1] have found that next to the thyroid, heart and circulation, the eyes are of chief interest in exophthalmic goiter, and in this series of 85 cases the eyes were negative or unnoted in 8. In 20 cases the 4 cardinal signs, exophthalmos, von Graefe's lid sign, Stellwag's and Moebius' weak convergence were all present. Exophthalmos, von Graefe's and Moebius' in 8. Exophthalmos and von Graefe's in 8. Exophthalmos and Stellwag's in 10. Exophthalmos and Moebius' in 4. Exophthalmos alone in 20. Reflex winking was sometimes lessened, as was also the wrinkling of the forehead in looking up, but neither of these seem important symptoms.

[The diagnosis of exophthalmic goiter from eye symptoms alone is not always an easy matter. A few weeks ago I saw a case in consultation with a colleague which, at the first blush, certainly impressed one as being an ordinary case of Graves' disease. On a critical examination, however, it was found that the apparent exophthalmos had always existed and was probably congenital. The so-called Moebius' sign was due to valvular disease of the heart and the Graefe sign was, to say the least, doubtful. There was little or no thyroid enlargement and the tachycardia was probably due to the disease of the heart.—ED.]

The Relation of Disease of the Nasal Accessory Sinuses to Diseases of the Eye. Geo. Mackay[2] divides these diseases clinically into the following groups: 1. Mucoceles of the accessory sinuses. 2. Sinusitis, acute or chronic, accompanied by obvious external signs of orbital cellulitis, abscess formation, tumor growth, edema of lids, or apparent dacryocystitis. 3. Sinusitis without external signs of inflammation in the orbit or neighboring tissues, but (a) with ophthalmoscopic signs, such as optic neuritis, neuroretinitis, retinal thrombosis, or phlebitis, etc., and (b) without ophthalmoscopic signs, but with disturbances of vision, such as central scotoma or limitations of the field of vision, paralyses of ocular muscles, or disturbances

---

(1) Boston Med. and Surg. Jour., March 12, 1908.
(2) The Lancet, August, 1908.

referable to the fifth nerve. 4. Cases in which the association with sinus disease has been asserted, but is more questionable, such as glaucoma, iritis, uveitis, keratitis, opacities of the lens and vitreous, etc.

The writer emphasized the necessity of studying the paths by which inflammation or neoplasms spread from the sinuses into the orbit as influencing appropriate surgical treatment; the subperiosteal operation was to be preferred when possible; he invited discussion as to the means of differentiating between orbital cellulitis due to sinus disease and other causes such as syphilitic or tuberculous periostitis, and finally he commented upon the difficulty of recognizing the presence of empyema in the absence of nasal symptoms or of obvious orbital mischief.

Risley, Sr.,[1] gives the histories of 3 patients to emphasize the very frequent relation of *cause and effect existing between various forms of eye diseases and affections of the bony sinuses.*

Case 1 occurred in a man who had been suffering from severe pain in the head aggravated by use of the eyes and often culminating in violent attacks of sick headache; the correction of mixed astigmatism gave relief from his violent attacks, but he was nevertheless unable to use his eyes with comfort. Swollen middle turbinals were cauterized, pressure and obstruction removed, and the eye symptoms disappeared.

Case 2 occurred in a man of 42, who suffered from failing vision (1/5) and constant frontal headache. Amputation of both middle turbinals was followed by a profuse discharge of pus, and almost instant relief from headache and undue sensibility to light.

Case 3 presented firm blocking of the right upper nasal fossa by hypertrophy of the middle turbinal; purulent inflammation of the right frontal sinus; filtration into right maxillary antrum, necrosis and destruction of the floor of the frontal sinus; abscess of the orbit; proptosis of the eyeball; optic neuritis with reduction of vision to 1/5. Recovery through surgical procedure.

C. S. Bull[2] remarks the increase in frequency and gravity

---

(1) Annals of Ophthalmology, October, 1908.
(2) Annals of Ophthalmology, October, 1908.

of this form of infection during the last few years, especially in the United States, and to the extraordinary variability in the virulence of action of the germs. During the past winter and spring he has seen a goodly number of cases of severe inflammation of the eye and its adnexa due to *mixed infection by the pneumococcus and streptococcus.* He gives detailed histories of 6 examples of such infection.

The points emphasized in the study of these cases are: The marked insidiousness of the attack and the varying duration of the period of incubation; the extreme violence of the symptoms in the sudden onset of the attack; the very rapid rise of temperature and the equally sudden fall after operative interference has opened the purulent deposit; the rapid development and violence of the symptoms point apparently to an unfavorable prognosis; immediate and active interference with free incisions, thorough curetting and irrigation, and prolonged and careful hunting for the purulent foci, soon bring about a more favorable condition; the necessity for great vigilance in watching the cases and searching for new foci on any sudden and rapid rise in temperature; the patients were all young, the oldest being 21 years and the youngest 9 months. In only 1 case was the eye lost from suppuration.

Logan Turner[1] divides the large air spaces surrounding the orbit into two groups, an anterior and a posterior, a subdivision useful both clinically and anatomically; the anterior group comprises the frontal and anterior ethmoid cells and antrum, and these have orifices into the middle meatus of the nose; the posterior ethmoid and sphenoid cells empty into the superior meatus. Disease of the anterior group affects the eye directly by compression and displacement. The posterior group is closely related to the optic and oculomotor nerves, being separated by the thinnest bony septa, in some cases incomplete, and then the partition consists merely of thin layers of lining membranes.

The difficulty in exact diagnosis of the site of lesions is the irregularity of the position and relation of the cells, both to the median line and to the roof and floor of the

---

(1) The Lancet, Aug. 8, 1908.

orbit; this necessitates a constant alertness in operation, since the unexpected is constantly cropping up.

The venous distribution is of great importance; all the air spaces have venous return, which passes into the orbit and thence by the ophthalmic vein into the cavenous sinus.

Axenfeld[1] calls attention to the fact that *transient attacks of inflammation of the lining membranes of the posterior cells may frequently account for retrobulbar neuritis,* even though there is no closure or empyema of these cells. This is probably due to the frequent deficiency of the bony walls of the groove in which lies the optic nerve. It is notorious how frequently it is asserted that chills had marked the onset of attacks of retrobulbar neuritis, and he thinks that affection of the air cells is the connecting link. On the point of exploration and draining of affected air cells in case of eye disease, he thinks that the matter is properly within the province of the ophthalmic surgeon, and that he should be prepared to examine the nose thoroughly in any suspicious case and treat it himself. The old idea that the field of eye surgery is bounded by the bony walls of the orbit was exploded long ago, in fact, as soon as the eye surgeon adopted Krönlein's operation as being within his particular province.

Tuberculosis as a Cause of Ocular Disease. Derby[2] calls attention to the necessity of a more careful consideration of tuberculosis as an etiologic factor in eye diseases, and refers to the investigations of Stock, who was able to produce in rabbits uveitis scleritis, sclero-keratitis, nodules in the conjunctiva and swellings in the lids by injecting tubercle bacilli into the blood. He refers to the ophthalmo-reaction of Wolff-Eisner and Calmette and to the cutaneous reaction of von Pirquet, calling attention to the many unsolved problems connected with these reactions, such as their relative delicacy, their relationship to each other and to the subcutaneous test and the meaning of the various types of reactions which occur.

The author reports his results in 103 cases. Of these 83 were positive, 18 negative and 2 doubtful. The

---

(1) The Lancet, Aug. 8, 1908.
(2) Archives of Ophthalmology, p. 515, 1908.

conjunctival test was made 61 times; 45 positive, 14 negative and 2 doubtful. The cutaneous test was made 58 times; 52 positive, 4 negative, 2 doubtful. Both tests were made on 16 patients, and on 14 both were positive. Of the cases that were thought to be tubercular, there were 43 cases of phlyctenular disease, of which 88 per cent. gave a positive reaction; 16 cases of relapsing sclero-keratitis, all positive, 100 per cent.; 16 cases of scleritis, 81 per cent. positive; 9 cases of uveitis, all reacted positively; 3 cases of interstitial keratitis, 2 positive; 4 cases showing vitreous opacities and cloudiness in the lens, 1 was positive, 2 negative, 1 doubtful. A case of tuberculosis of the conjunctiva gave a positive reaction. In 4 cases reaction did not occur until after 48 hours. In these cases the patients appeared to be in good general condition, and Wolff-Eisner believes this to be the reaction of the clinically healthy who have an encapsulated focus. In several cases the conjunctival reactions were severe. In the author's experience the cutaneous reaction has been more sensitive than the conjunctival, and has shown no untoward results. Wolff-Eisner believes that a positive conjunctival reaction points to active tuberculosis, while the cutaneous tests may appear when there is a healed lesion.

The author believes that the present weight of evidence tends to prove that the cutaneous test is specific and of great value. Darby's investigations point strongly to a tubercular origin in his cases of phlyctenular disease; out of 19 cases 16 showed evidences of tuberculosis on physical examination.

The Conjunctival Tuberculin Test. Although this matter is also briefly treated elsewhere in this volume it seems proper to refer to it under the caption of the relation of general diseases to the eye. Mannheimer,[1] for example, points out that the symptoms of *the Wolff-Eisner* (Calmette) *reaction* appear in from 3 to 12 hours in most cases, but may be delayed 24 to 48 hours. They are a scratchy feeling, lacrimation, redness and swelling of the inner canthus, then of the conjunctiva of the lower lid, which may increase and include the entire conjunctiva, with edema of the lids.

---

(1) New York Med. Jour., Sept. 5, 1908.

The reaction usually disappears within 2, 3 or 4 days, but may last a week. Patients are usually not inconvenienced, some not even with third degree reactions. Others complain of pain in the eye and head.

He gives examples of occasional absorption of the tuberculin into the system. As contraindications he includes "any existing disease of the eyes, except errors of refraction, or any tendency thereto; or traces of previous disease; scrofulous children; hay fever; ordinary colds; perhaps also the administration of iodids." He believes that if we avoid cases in which such contraindications are present, no untoward effects will result.

He mentions the unpleasant sequelæ which have thus far been reported to show that the test is not harmless and also to prove that some of the sequelæ are preventable. He has made the test 350 times with no harm; the few severe reactions all passed off without mishap.

He concludes with the following general impressions: "The conjunctival test has fulfilled all reasonable expectations: It is beset with apparent discrepancies which we are yet unable to explain. It opens up many new and interesting questions. It will, of course, never take the place of a careful physical examination. It requires caution in its application and interpretation. It should be used judiciously so as not to bring it into discredit. It is important that we try to follow up our cases so that we may ultimately get an insight into the causes of the failures of the method."

[Irons (pp. 201-203 of Casey Wood's *Ophthalmic Therapeutics*) gives the following *resumé* of our knowledge of this important test. I quite agree with him in thinking that permanently serious results very rarely follow the exhibition of *one drop of a 1 per cent. solution of tuberculin* instilled into the conjunctival sac, *provided both eyes are, and for some time previously have been, normal.*

Where one or both eyes have been recently affected it is better to use the von Pirquet or Moro test. Moreover, I believe that *only an ophthalmologist is competent to decide whether a given eye is or is not normal,* and he should, accordingly, be the one to apply the test. Applied in this way the Wolff-Eisner reaction is safe and reliable.

Shortly after the publication of the observation of Wolff-Eisner that the instillation of tuberculin into the eyes of patients with tuberculosis produced a decided conjunctival hyperemia and exudation, Calmette reported a series of observations on tuberculous and non-tuberculous patients and showed that the reaction is typical and specific. The test is performed with old tuberculin which has been precipitated by alcohol, dried and redissolved in water.

One drop of a 1 per cent. solution is instilled into the conjunctival sac. In 3 to 8 hours a varying degree of hyperemia appears, accompanied by some lacrimation and subjective irritation. The hyperemia reaches its maximum in about 24 hours and then gradually subsides. Frequently there is pronounced exudation and occasionally edema of the lids and surrounding tissues. Baldwin has suggested the following scheme for recording the reactions:

Negative—No difference in color when both eyelids are pulled down and compared.

Doubtful—Slight difference with redness of the caruncle.

*—Distinct palpebral redness with secretion.

**—Ocular and palpebral redness with secretion well marked.

***—Deep injection of entire conjunctiva with edema of lids, photophobia and secretion.

As in the case of the cutaneous reaction of v. Pirquet, positive reactions have been obtained in many cases not suspected on clinical grounds of being tuberculous. The frequency with which the reaction is found in supposedly non-tuberculous individuals calls to mind postmortem statistics in which it has been found that in over 90 per cent. of individuals dying from all causes, some trace of tuberculosis such as apical scars, etc., is found. In drawing conclusions from the ophthalmic as well as from the cutaneous and other tuberculin tests we must be guided not only by the specific reaction, but also by the other clinical findings.

The following table compiled by Hay summarizes the comparative results reported by some twenty observers, using the methods of Koch, v. Pirquet and Calmette.

		Total No. of Cases.	Positive Reaction.	Percentages.
Tuberculous cases	Koch*	....	....	100.0
	Pirquet	291	237	81.5
	Calmette	1,419	1,191	88.5
Suspected cases	Koch*	....	....	88.6
	Pirquet	281	208	79.0
	Calmette	516	268	51.9
Non-tuberculous cases	Koch*	....	....	55.5
	Pirquet	418	250	59.8
	Calmette	1,320	204	15.4

The easy technic of the ophthalmic tuberculin test renders it particularly attractive as a means of diagnosis. It should be remembered, however, that it is not entirely without danger, and tuberculin even in dilute solution should not be indiscriminately instilled into the eyes of patients. Care must be taken that the test is carried out only in normal eyes.

The instillation of tuberculin often gives rise to a local hypersusceptibility to tuberculin, and hence a second instillation should not be made into the same eye. In comparison with the thousands of ophthalmic tests, the accidents with Calmette's reaction have been relatively few. There are, however, a considerable number of cases on record in which the reaction has been attended by corneal ulceration, keratitis, etc., with permanent injury to vision, even in healthy eyes.

Citron outlines certain restrictions to the use of the test; the reaction should not be tried unnecessarily in scrofulous children, in persons exposed to conditions which may easily cause inflammation, in districts where trachoma is prevalent, in patients who have been tested before, in patients under treatment with tuberculin, in cases where one eye is or has been diseased, and in cases where the diagnosis is clinically certain."—Ed.]

Wasserman and Spirochæta Tests in the Diagnosis and Treatment of Ocular Syphilis. Of the large amount of literature on this subject one of the papers most practical for the ophthalmologist is that by Harris and Corbus.[1] I cannot give even an abstract of this article here—for want of space—but would advise its perusal to all my readers. Their conclusions are:

---

* Frankel and Beck's statistics.

(1) Jour. Am. Med. Assoc., Dec. 5, 1908.

The *Spirocheta pallida* is the true cause of syphilis and its presence is equivalent to the diagnosis of syphilis. Its absence does not rule out syphilis.

The silver spirochetes are true organisms.

By means of this method the spirochete may be demonstrated in all primary and secondary lesions of syphilis, if the search is persistent.

After demonstrating the organism in a primary lesion it is not only unnecessary but harmful to wait for secondary manifestations. The most logical therapy is excision of the chancre when possible, and in all cases the immediate institution of vigorous antisyphilitic treatment.

They also call attention to the great value of the dark ground illuminator for the demonstration of the *Spirochæta pallida* and to emphasize the necessity and value of the demonstration of the spirochete in the diagnosis and treatment of syphilis where there are accessible lesions. In suspected cases with no lesions and in cases in which there are cutaneous lesions, in which we fail to find the spirochete, they *have found the Wassermann serum diagnosis of great value.* As it is, these two procedures practically give us control of the diagnosis of syphilis, and it is to be hoped that the near future will give us a reliable method of detecting syphilitic antigen and thus furnish us with an absolute method of saying when the disease is cured.

[So convinced am I of the extreme value of both these procedures (especially of the Wassermann chemical test in the absence of lesions that can readily be reached) that I advise it in many cases of ocular syphilis, as much as an indication for treatment as in diagnosis. My purpose is to institute, limit or refrain from anti-luetic remedies as the Wassermann test shows the presence, decrease, or absence of the blood infection.. These tests should be made from time to time during the conduct of chronic cases.—Ed.]

OCULAR TUMORS.

Symmetrical Angiomata of the Superior Tarsal Conjunctiva. L'Ancona[1] reports the case of a child, 2 years

---

(1) La Clinica Oculistica, January, 1908.

old, who had a small red body behind the lid partly covering the right cornea and visible when the eyes were opened. Pain was apparently not present; there had been no hemorrhage. A more careful examination showed the presence of a small swelling between the lid and cornea. On raising the lid one could see a tumor as large as a big blackberry, of a red wine color, smooth surface, soft, elastic consistence, non-reducible by pressure, sessile, implanted by a 2 or 3 mm. base from the tarsal conjunctiva to the superior fornix. The left eye at superficial glance appeared normal but on raising the lid the same character of tumor, smaller, was seen at the same place with surface slightly uneven. Both tumors were removed with a bistoury after tying off the bases. Hemorrhage was controlled by pressure. Under the microscope sections showed blood vessels dilated and some new formed, others joined to form large cavities. Between the vessels were trabeculæ of connective tissue. The diagnosis was *cavernous angiomata of the conjunctiva.*

Tumor of the Iris, Existing for Twenty-two Years. Groenouw[1] describes the left eye of a man, aged 41, that presented, in the lower temporal sinus, a brown tumor of the iris, 6 mm. long, 3 mm. wide, without other changes of the iris. The refracting media were clear, the optic nerve excavated, vision reduced to perception of light. The patient had noticed the tumor twenty-two years ago, when it had exactly the same dimensions, according to the records of the ophthalmic surgeon, and vision with a cylinder, = 6/v. It could not be ascertained whether the tumor had existed even longer, perhaps from birth on. It caused no disturbances until five years ago, when the eye gradually grew blind without inflammatory symptoms.

From similar cases from literature, Groenouw considered it either as a very slowly growing melansarcoma or as a melanoma existing over twenty years which became sarcomatous within the last few years. Most likely an early removal of the tumor by iridectomy would, on account of its benign character, have affected a cure with preservation of sight, although in general enucleation of the eye-

---

(1) Centralbl. f. pkt. Augenheilk., p. 101, 1908.

ball is given preference by various authors, as sometimes besides the original tumor, metastatic nodules may occur in the iris, which remain after iridectomy and cause relapses.

[In the monograph on Sarcoma of the Iris, written by Brown Pusey and myself, advice is given to note and draw the attention of patients to suspicious "spots" on the iris, since a certain percentage of these develop malignant characters.—ED.]

Glioma of the Retina. Enucleation and Recovery. Schneider[1] gives a full report of the enucleation of the eye of a child of 2 years for glioma of the retina in an early stage. *There has been no recurrence after six years.*

Spontaneous Cure of a Tumor Diagnosed as Sarcoma of the Orbit. A 16-year-old patient was suffering from a tumor at the margin of the orbit, which extended to the deeper structures and was accompanied with intense pain. It seemed impossible to extirpate the entire tumor, which was declared to be sarcoma.

The patient was treated by Korter[2] with iodid of potassium for half a year and the tumor had almost all disappeared, but after four years it had entirely disappeared.

Calcifying Fibroma of the Orbit. A boy 14 years of age, without syphilitic, tuberculous or other diathesis, three years before he came under the observation of Roy[3] complained of pain in the left eye and impairment of vision, and these symptoms were followed by exophthalmos.

A tumor the size of a "nut" was removed from the orbit, and the pain continuing the ball was enucleated. Two years later there were swelling of the orbital tissue and severe pain and headache, and a sanious discharge flowed from the orbit.

A large tumor filled the orbit and extended beyond its upper margin, and when removed was found to consist of a fibroma with numerous small foci of calcification.

---

(1) Ophthalmic Record, August, 1908.
(2) Wien. med. Woch., July 4, 1908.
(3) Annales d'Oculistique, July, 1908.

INSTRUMENTS AND APPLIANCES.

An Illuminated Eye Spud and Knife Needle. Carson[1] remarks that the removal of a foreign body from the cornea, particularly where the object is small, and difficult to see, often requires three hands, one hand to hold the lids, another for the eye spud, and a third to condense the light on the eye. Every physician knows how difficult and awkward it is to hold a patient's lids and with the same hand try to condense the light on the cornea.

Fig. 4. Carson's Combined Illuminated Eye Spud and Knife Needle.

With the end in view of rendering this common operation easy of performance, he devised an instrument which does away with the need of an extra hand to condense the light on the cornea. This is an instrument which combines the spud and light, consisting, as originally devised, of a handle about five inches in length, through which run the wires to a tiny incandescent condensing lamp at its end. A short distance from the end of the handle is a clamp into which is fastened a spud of sufficient length, and bent at such an angle as to bring its tip into the center of the circle of light thrown by the lamp.

The spud is attached directly at the end of the handle, the light being thrown on the field at an angle through an arm thrown out from the side of the handle. The same instrument, with a knife needle in place of a spud, is admirably adapted to the performance of the operation for secondary cataract, where the illumination is of so great importance.

An Illuminated Spud. A. C. Snell[2] also believes that "Most of the difficulties encountered in the removal of any foreign substance from the cornea of the eye are those which have to do with obtaining and maintaining proper

---

(1) Jour. Am. Med. Assoc., p. 1523, 1908.
(2) Ophthalmology, April, 1908.

illumination at the exact point of operation. In order to focus the light brightly on the object to be removed there is commonly used a four-inch condensing lens which is held at the proper focusing distance between the source of light and the object to be illuminated. The source of light is a fixed point while the area of illumination, the cornea, is a spherical, movable surface. When these three factors—source of light, condensing lens, and illuminated area—are in their proper relation to each other a foreign body can be clearly seen. In order to accomplish this desideratum the patient's head must be turned in the right direction so as to bring that portion of the cornea in which the foreign body lies in the direction of the line of light, the patient must fix his eyes steadily on some object (being directed to keep both eyes open), and the surgeon or an assistant must hold the condensing lens steady and at the right focal distance. If the patient fixes his eyes as directed, if he holds his head perfectly still, if the condensing lens is held at the right focus, and if the spud, hand or arm does not get into the way or obstruct the light, it would be an easy procedure to remove a foreign body. But it is rare, indeed, when all these conditions exist. It is seldom that a patient can fix his eyes on an object, or hold his head still, while the surgeon digs out a piece of steel or other foreign substance from the cornea. Any movement of the patient's eyes or head, or of the condensing lens, throws the foreign body out of view and renders our efforts at removal futile.

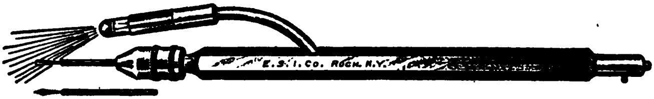


Fig. 5. Snell's Combined Eye Spud and Needle Holder.

"Although the removal of a foreign body from the cornea seems to be a simple matter, every one who has done much of this work has had his patience sorely tried in his attempts to get the patient to fix his eyes properly and to hold his head as it is placed while the surgeon holds the condensing lens in one hand and a spud in the other. When we use an eye speculum to aid us we find the patient is still more difficult to control, and an assistant to hold the lids open is not always at hand. Under such circumstances we all have wished for more than a single pair of hands and have found that the operation is not so simple as it at first appears.

"However, with the use of the electrically-illuminated spud, herewith illustrated, most of these difficulties are eliminated. The source of light, the condensing lens and the spud are all incorporated into one instrument and thus require the use of but one hand, leaving the other free. The condensing lens-lamp is so placed that the area of focal illumination always lies in the center of the field of operation; that is, it is just in front of and surrounding the point of the spud; so that the proper relation between these essential factors—the source of light, the condensing lens, and the object—are practically fixed and invariable. The condensing lens-lamp is placed in front of the operator's hand so that nothing can possibly get into the path or into the field of illumination, and the light is always where the operator wishes it to be, no matter where the patient turns his head.

"With the use of this instrument the operator may stand in any position he chooses, either in front of his patient or behind him, to suit the surgeon's convenience. The patient may hold his head in any comfortable or natural position, and he may be placed either upright in a chair or in a reclining position on the office table as may be most convenient. A speculum is unnecessary, as the free hand may be used to hold the lids open."

He has found also that this instrument is useful and convenient in performing a capsulotomy after cataract extraction, many of the same annoying difficulties being removed that are encountered in the removal of a foreign body from the cornea.

He claims that the advantages of this instrument to the surgeon over the old method are:

1. The light is always exactly where the operator wishes it.
2. Nothing can get in front of the light to obstruct it.
3. The operator may choose any position.
4. Patient may rest his head in any comfortable position.
5. An assistant is unnecessary.
6. A speculum is not necessary.
7. Spuds can be removed from the handle for sterilization, or, in fact, the entire instrument may be boiled.

The mechanical advantages of this instrument are:

a. It is light in weight and well balanced.

b. Being hexagonal, the operator can get a firm grip.

c. By a chuck mechanism the spuds are securely held and can be easily removed from the handle of the instrument so that different forms of spuds or knives may be used.

d. The more expensive parts of the instrument are practically indestructible and the spuds or knives can be replaced when they become unfit for further use.

A New Pterygium Knife. Young[1] has invented an ingenious and useful set of kidney-shaped blades set on the shank like a keratome, with rounded ends instead of sharp points. They are made right and left, and have double cutting edges, one convex, the other concave. It is possible to shave a pterygium from the cornea smoothly, and deep set eyes can be reached with ease.

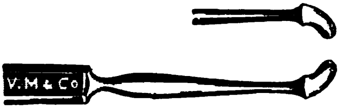


Fig. 6. Pterygium Knife—Young.

A Knife Guard in Tarsal Subsection. In an illustrated article on the subject Ewing[2] shows fully the method of suturing the conjunctiva into the bottom of the wound made by the subsection of the tarsus and the tying of the sutures upon the skin surface. He has added to the instruments used in performing his entropion operation a knife devised by Green, Sr., provided with a guard which

---

(1) Ophthalmic Record, March, 1908.
(2) Ophthalmic Record, January, 1908.

serves to keep the incision throughout its full length an even distance from the margin of the lid.

A Simple Instrument for Cauterizing Corneal Ulcers. Frank Todd[1] has devised a modification of Wordsworth's cautery instrument. It consists of a handle and shank with a copper ball at the end of the latter, which has a platinum point extending from it at an angle. The copper ball holds the heat so that the point is hot enough to cauterize the cornea for several minutes.

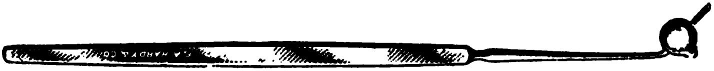


Fig. 7. Frank Todd's Instrument for Cauterizing Corneal Ulcers.

A New Knife for Iridotomy. G. B. Jobson[2] has invented a knife set at the end of the shank at such an angle and of a size that it enables the operator to introduce it at the sclerocorneal junction on the flat and then pass it to the opposite side of the anterior chamber, when it is turned; the point of the blade then engages the iris and is pushed through it at a point to one side of the median line. The blade, being set at an angle to the shank, cuts easily through the iris as it is drawn toward its point of entrance. A similar incision is then made in the iris on the other side of the median line. These two incisions converge and meet above as near the sclerocorneal juncture as possible. A triangular flap is thus liberated in the iris, with its base attachment below. This flap can be dealt with by making an incision below and pulling the flap out and cutting it off.

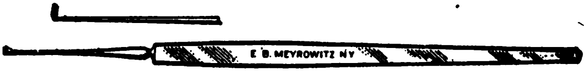


Fig. 8. Knife for Iridotomy—Jobson.

A Wire Lid-Elevator for the Prevention of Loss of Vitreous Humor in the Operation for Extraction of Cataract. Moraweck describes this instrument in the *Ophthalmic Record* for May, 1908. It is 5⅝ inches long

---

(1) Ophthalmic Record, April, 1908.
(2) Ophthalmic Record, September, 1908.

and the ocular end is formed into a wire loop bent on the flat to pass under the lid, the other end terminates in a wire ring through which the finger can be inserted in holding it. An elevator is used for both the upper and the lower lids. These are held by an assistant, who pulls the lids well away from the globe.

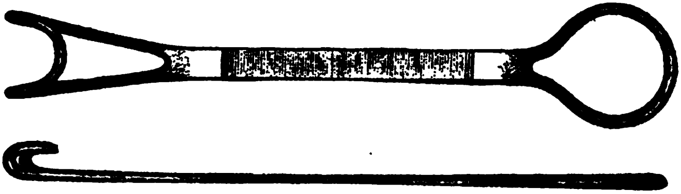


Fig. 9. Moraweck's Lid Elevator.

Complete Peripheral Capsulotomy. A cystotome has been devised by Valk[1] which resembles the usual cystotome, except that instead of a knife tip set at right angles to the shank it has a needle point. It can be moved about in the pupillary space without wounding the margins of the iris. The instrument is introduced underneath the iris in making the lower capsular tear, and is carried on around

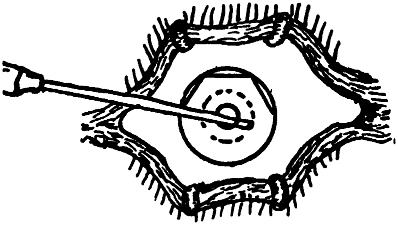


Fig. 10. First Position. Point of Cystotome Turned Inward.

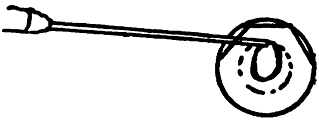


Fig. 11. Second Position.

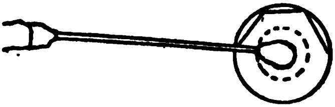


Fig. 12. Third Position.

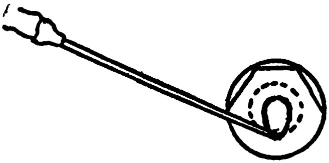


Fig. 13. Fourth Position—From This Position Back to First.

Complete Peripheral Capsulotomy (Valk).

---

[1] Ophthalmic Record, August, 1908.

to one side and then above, where the iris is pushed upward and then downward to the starting point. A round piece of capsule is thus detached which probably comes away with the lens. He finds that since adopting this method he does not have to do subsequent needlings for opaque capsules.

Diaphanoscopy in Glaucoma. Glaucoma occurs in two forms, anterior and posterior glaucoma. Anterior glaucoma may be acute or chronic, primary or secondary. The primary may be due to increased secretion of aqueous, and increase of albuminous elements, or to sclerosis of the vessels causing obstruction of the iridic infiltration angle. Myotics or iridectomy act favorably in these cases. Posterior glaucoma is the chronic simple non-inflammatory type, is due to obstruction of the vorticle veins of the choroid and is usually accompanied by general arteriosclerosis. Excessive pressure is mostly confined to the vitreous chamber. It is not materially affected by any local treatment, except possibly galvanism and ocular massage. Würdemann[1] believes that transillumination assists in the diagnosis of glaucoma in the anterior types. The diaphanoscope is applied to the sclera at the outer canthus. The pupil is lighted up and if the eye be looked at obliquely the ciliary body will appear as a dark ring some few millimeters from the corneal margin, at which another dark ring appears caused by the root of the iris. Between these two rings is an illuminated area which corresponds to the circumlental space. It is usually about 3 or 4 mm. wide. It is enlarged during accommodation. It may be encroached upon or obliterated by changes in the size of the ciliary processes. A family tendency to a narrow circumlental space predisposes toward glaucoma. Diaphanoscopy is negative in posterior glaucoma unless the anterior chamber becomes smaller.

OCULAR THERAPEUTICS.

SERUM-THERAPY IN DISEASES OF THE EYE.

The present state of our knowledge of this subject is given by Axenfeld:[2]

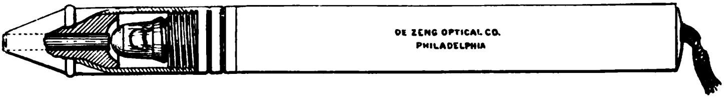
---

(1) Ophthalmic Record, March, 1908.
(2) British Med. Journal, Sept. 12, 1908.

In obstinate cases of blepharitis and hordeola the subcutaneous application of staphylococcus vaccine might prove useful. The healing action of Behring's antitoxic diphtheritic serum on the conjunctivitis produced by Loeffler's bacilli is so well established by experimental and clinical observations that it is hardly necessary to dwell upon it. He thought the pollantin serum of Dunbar good in some cases of hay fever, but not in all, and the result was never permanent. The jequiritol serum of Roemer, which was employed to arrest the violent action of jequiritol when used in cases of pannus from trachoma, etc., prevented necrosis from too violent reaction, but was not always successful.

With regard to serum therapy in pneumococcus infections the form of remedy prepared by Roemer and Merck he did not consider fulfilled the high therapeutic requirements necessary for the treatment of ulcus serpens. It possessed some curative properties, but did not act so certainly that it could take the place of surgical treatment altogether. It could only be employed in benign cases when conservative treatment was justifiable, or in which other treatment was incapable of arresting the destruction of the cornea. Von Hippel's tuberculin treatment had, in a large number of cases of tuberculosis of the eyeball, caused a complete cure. Wright and others had asserted that the injections of large doses, as recommended by von Hippel, had done more harm than good, so that ophthalmologists required a special series of researches to decide the question of dosage. Axenfeld said he was still experimenting, but his own experience was so far rather in favor of von Hippel's method than the other. He had found that extremely chronic cases of tuberculous iridochoroiditis are influenced in but a very small degree by the tuberculin treatment.

Darier and Deutschmann had asserted that as good or better results were to be obtained by the use of non-specific serums, such as that prepared from diphtheria, tetanus and yeast, against *all* kinds of infection, and to such the term "polyvalent serum" was applied. He did not think that the non-specific serums held out anything like such a good prospect of success in definite cases as the specific serums, and he believed much experimental evi-



Ocular Transilluminator, ⅔ Actual Size.

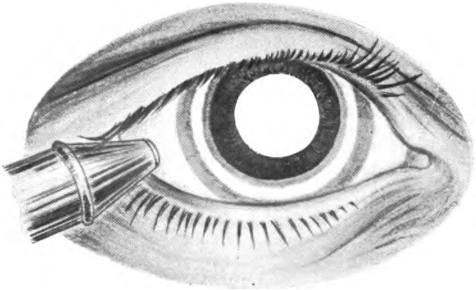


PLATE I.

DIAPHANOSCOPY OF THE EYE, SHOWING THE CIRCUMLENTAL SPACE.

The pupil is moderately dilated, the root of the iris shows as a dark ring around the limbus, then a clear ring is seen, which is the circumlental space, surrounded by another dark ring caused by the shadow of the ciliary processes; outside of this ring the sclera is brilliantly illuminated. In the drawing the differences in illumination are slightly emphasized and the lighting of both sides of the globes are equalized. In practice the conditions are best observed on the opposite side to that which the tip of the transilluminator is applied. The drawing is semi-diagrammatic.—Würdemann (Page 153).

dence to be necessary before the results of Darier and Deutschmann could be accepted.

As regards the technic of serum treatment, as a rule it was more efficient when injected subcutaneously than when applied locally to the part. Subconjunctival injections of serum were not much to be recommended, while the subconjunctival injection of vaccines, that is, dead bacteria, was irrational, as before it could produce any healing effect it would have to produce anti-bodies from the spleen, bone marrow, etc., and applied directly to the eye it would only act as an irritant, and thus increase the local affection.

The Use of Staphylococcic Vaccine in the Treatment of Hypopion-Ulcer. Three cases are reported by Grey-Edwards.[1] These resisted all treatment, including subconjunctival injections of cyanid of mercury. They healed quickly after the injection, in the back, of a vaccine of dead staphylococci.

Antidiphtheritic Serum in Severe Infections of the Eye. Teulieres[2] has employed this serum in eye affections of an infective nature, especially in hypopion keratitis. He has found that it is a curative agent; often, however, only a useful adjuvant to the usual methods employed in these conditions. It should be used subcutaneously and as soon after infection as possible. It may be employed as a prophylactic measure. His results show that it ameliorates the pain, checks the progress of the infection and favors the absorption of the infiltrate and exudate and the formation of newformed tissue.

Antistaphylococcic Vaccine. Maddox[3] reports the case of a man of 78 years who was operated upon for cataract. On the third day he developed acute gout, with eczema of forehead and scalp. By the next day there were evidences of wound infection, which went from bad to worse until the eye seemed lost, notwithstanding active cauterization of the infected wound and the administration of polyvalent antistreptococcic serum. Wright's antistreptococcic vaccine (S. aureus) was then injected with immediate improvement, terminating in resolution with V = 7/xii.

---

(1) The Ophthalmoscope, February, 1908.
(2) Die Ophthal. Klinik, April 20, 1908.
(3) The Ophthalmoscope, June, 1908.

DRUGS.

Sophol in Disease of the Eye. Sophol, the trade name given a *combination of silver with formaldehyde-nucleic acid,* contains 22 per cent. of silver. It was employed by Bock[1] usually in a 5 per cent. aqueous solution. It was found to be especially valuable in ophthalmia neonatorum and of service in all affections of the conjunctiva accompanied by profuse discharge. It is a mild, non-irritating bactericide, and its action is superficial.

Glycerin as an Adjuvant to Silver Nitrate. Harman[2] comments on the numerous albuminoid preparations of silver now on the market and in vogue principally because they cause less pain than the nitrate. After experimenting he found a formula which reduced the pain caused by nitrate of silver. He adds 15 per cent. of pure glycerin to a 0.5, 1 or 2 per cent. solution of silver nitrate in distilled water. This raises the specific gravity of the pigment and increases its penetrative action on account of the hygroscopic powers of glycerin. He has used this preparation on a large number of patients, and finds it distinctly less painful than the ordinary solution of nitrate of silver, and rather more effective. The salt does not lose in caustic action, since a fine pellicle of destroyed epithelium can be seen, but the pain is reduced by the action being spread over a longer period.

The Treatment of Affections of the Conjunctiva and Cornea With Jequiritol. Jequirity produces, as well known, a special conjunctivitis—jequirity ophthalmia, and is characterized by an injection of the conjunctiva, which becomes intense, and finally inflammation and purulent secretion with edema of the lids and enlargement of the pre-auricular lymph node and also rise of body temperature occur. In eight or ten days this all disappears. Jequirity was first employed especially in chronic trachoma with pannus, and it is in that the best results are had, because as part of the inflammation there supervenes a serous infiltration of the cornea, which favors a removal

---

(1) Woch. f. Ther. u. Hyg. des Auges, May 7, 1908.
(2) British Med. Journal, Sept. 12, 1908.

of the corneal opacities. But the difference in the strength of the solutions has made a difference in the effect and in some cases serious results have followed, and with many the use of the drug has been abandoned.

During late years there has been much investigation as to the active principle of the jequirity, which was found to be abrin. Some authors consider this to be an alkaloid, while others look upon it as a bacillus. Max Brieger proved it to belong to the toxalbuminoses. The most interesting part of the researches with abrin have shown that the conjunctiva, having already suffered from jequirity, becomes immune to a second inflammation. Erhlich has proved that animals which are given more or less strong doses of abrin, preserve immunity in both eyes from the drug. In France, Calmette and Dalard studied the immunity produced by abrin; and Lapersonne applied the abrin antitoxic serum in man. Römer in Germany made a special preparation by means of abrin which he calls jequiritol and gives the directions for its use. Thus he regulates the dose of abrin and produces a serum from immune animals—the jequiritol serum, which has the power of annuling the jequirity inflammation.

The jequiritol made by Merck, under Römer's direction, constitutes four solutions numbering one, two, three and four. One drop of solution No. 2 is ten times stronger than No. 1, and so on.

Cosmettatos[1] in applying the remedy begins with solution No. 2, and ends with Nos. 3 and 4, using from one to four drops. Generally during the use of No. 3 the inflammation is produced. Once the full effect is procured the remedy is stopped. If the inflammation is insufficient the procedure is begun again. Only once has Cosmettatos had to use the antiserum where the inflammation and pain had become excessive. Its effects were good and the inflammation disappeared in a few hours. He reports twelve cases in which jequiritol was used.

[Having employed jequiritol from time to time for several years past I can add my own approval to the remarks of Cosmettatos. I believe that, when employed with care—in other words according to the directions

---

(1) La Clinique Ophthalmol., Feb. 10, 1908.

given—it is superior to jequirity and will not fail the ophthalmic surgeon.—Ed.]

Acoin in an Oil Collyrium. Darier[1] has used an ointment of acoin and thus produced analgesia for several hours; but this application is at first somewhat painful. Pflugk extols an oily collyrium of 1 per cent. acoin as a remarkable analgesic; he has tried it in one hundred cases. Darier states that acoin has the advantage of not paralyzing the accommodation, and of not dilating the pupil as does cocain; nor does it alter the corneal epithelium, which membrane becomes absolutely free from pain. The effect is instantaneous.

For the purpose of stopping the burning sensation of powdered dionin it is only requisite to apply a few drops of the oily acoin.

Pflugk has seen no ill effects from the remedy used in oil; the pain following wounds, and that from iritis, disappears at once, the analgesia lasting from twelve to twenty-four hours. Two per cent. acoin in oil produces a marked burning effect.

Darier concludes that we have thus an ocular analgesic which is active and harmless.

The Subconjunctival Injection of India Ink in the Eyes of Albinos. Komoto claims to have made decided improvement in the vision of albinos by the subconjunctival injection of India ink. Galtier[2] found that the operation was followed by no unpleasant results, and that it gave a bluish white tint to the sclerotic similar to that seen in eyes in which the choroidal color appears through a thin and translucent sclerotic, and not disfiguring. He proposes, in addition to the coloration of the sclerotic by India ink, to tattoo a peripheral zone of the cornea three or four mm. in width.

The Deep Action of Dionin. A man 48 years of age noted that the sight of his only useful eye was failing. Ten days later von Arlt[3] made an examination which showed a myopia of 5 D., V = 5/viii, an oval hemorrhage near the macula with a corresponding scotoma. Color

---

(1) La Clinique Ophthal., Jan. 10, 1908.
(2) Annales d'Oculistique, February, 1908.
(3) Woch. f. Therapie u. Hyg. des Auges, March 19, 1908.

sense showed diminution of one-half for green alone. No change having occurred in eight days, 0.005 gm. of dionin was placed in the conjunctival sac. In three minutes there was marked lymphatic engorgement which had reached its height in ten minutes. Five minutes later the patient remarked that the spot before the eye was smaller and fainter. V. = 5/vi pt. Next day V. = 5/iv pt. The hemorrhage, the difference in color sense and the scotoma had entirely disappeared. About one month later the patient returned with episcleritis but the visual functions were normal.

The author has no scruples in crediting the dionin with the result, as he states that he had followed the case before, during and after the employment of a single therapeutic measure.

Atoxyl in Sympathetic Ophthalmia, Trachoma and Some Syphilitic Affections of the Eye. Atoxyl is found to be of value in the treatment of all diseases caused by a protozoon rather than a bacterium, such as sleeping sickness, relapsing fever, syphilis, malaria, etc. In view of the possible causation of sympathetic ophthalmia by protozoa Gifford[1] tried atoxyl in two cases, and apparently with success. In one case, however, its value was questionable because of the simultaneous administration of large doses of sodium salicylate. The possibility of trachoma being caused by protozoa leads the author to suggest that atoxyl might be used with benefit both internally and locally in this disease. Atoxyl is a powerful poison and in large doses has usually caused blindness, therefore it is to be used with care. The author gave 30 minims of a 10 per cent. solution injected subcutaneously, at first twice a week, then every other day, till 18 grains in all had been given.

Bargy[1] reports a case of acquired syphilis who, in July, 1907, complained that the vision of right eye had gradually lessened. Examination revealed an iritis. Having had rheumatism, for which salicylate of soda was given, that was now ordered with atropin locally. On July 17 there was no amelioration and left eye became involved. July 18 an intramuscular *injection of half a gram of atoxyl* was given at 8 a. m. and all other treatment suspended. On

---

(1) Ophthalmic Record, March, 1908.

July 20 injection of another half gram of atoxyl. July 22, better, and a third half gram was injected. On July 24 all symptoms had disappeared.

Danger in Medication by Atoxyl. Hallopeau[1] has called attention to the dangers of anilido-arsenical medication in large doses, indicating the conditions in which this might be otherwise completely avoided by lessened doses. He relates the case of a woman 47 years old, who had alcohol neuritis and was given 5.10 gm. of atoxyl by intramuscular injection. A few days later failure of vision was noticed and in 14 days amaurosis followed. It is quite likely that the atoxyl was the cause of the blindness; at the same time the subnormal condition of the patient should be considered, she having had alcohol neuritis which brought a locus minoris resistentiæ to the action of the medicine. Then the large doses and also that the atoxyl (one of foreign make) contained free arsenates and arsenites, should be taken into consideration.

Hallopeau's personal observation is that out of 139 cases treated at the Saint Louis Hospital with French atoxyl, no visual trouble occurred. In a dozen patients treated by Hallopeau with a foreign make of atoxyl two experienced difficulty, but it was transient, showing that the foreign product was different from the French make. The author refers to other cases in which amaurosis supervened after a continuous medication with atoxyl for three months. And yet atoxyl is employed in the treatment of the sleeping sickness, at times in enormous doses, 55 grams being given in a few weeks, and lately the drug has been recommended as a prophylactic for that disease. Kopke of Lisbon has seen 14 patients treated by atoxyl; in 6 of them visual troubles were produced, and in 3 of these blindness followed. Gama Pinto found optic nerve atrophy in two; in another case he found unilateral hemianopsia; the smallest dose had been 5.50 grams. Hallopeau's method, which he considers safe, is to give decreasing doses of the French atoxyl, the first 0.75 gram, two days later 0.60 gram and three days later 0.50 gram.

Favorite Ophthalmic Remedies. As an indication of the *ocular remedies mostly used by Americans* the com-

---

(1) La Clinique Ophthal., Oct. 25, 1908.

mittee, of which the Editor happens to be Chairman, appointed by A. A. Hubbell, to suggest therapeutic agents to be incorporated in the next Pharmacopeia, chose as a preliminary list the following, from "New and Non-Official Remedies." It was felt that the Council on Pharmacy of the American Medical Association is the best guide in this matter. It is they who have investigated the chemic and therapeutic relations of the most important of that innumerable array of drugs that is yearly presented, to the confusion of the average practitioner. It will be noticed, *inter alia,* that *acoin and a few other more or less important agents are not included* in the list although it is, as has been noted in this Series for several years past, a favorite with many reputable therapeutists. However, it is not mentioned in "New and Non-Official Remedies" and for that reason was excluded from the list. What remedies from this long list have been selected by the Ophthalmic Section is, of course, not to be revealed until the annual meeting of the American Medical Association next June. Meantime, it may stand as a reference list for those who are interested in ophthalmic therapeutics:

ALBARGIN—Gelatose silver.

ALYPIN.

ARGENTAMIN—Liquor Argentamini—Ethylene-Diamine-Silver Nitrate.

ARGONIN—Casein silver—Silver casein.

ARGYROL—Silver Vitellin.

CHLORETONE—Chlorbutanol.

COLLARGOL—Collargolum—Colloidal Silver—Argentum Colloidale—Argentum Credé.

COLLARGOL OINTMENT — Unguentum Credé—Ointment of Colloidal Silver.

EPINEPHRINE—Dioxyphenyl-ethanol-methylamine.

ADNEPHRIN.

ADRENALIN.

SUPRARENALIN.

ADRIN.

BETA-EUCAINE HYDROCHLORIDE — Beta-Eucainæ Hydrochloridum—Eucaine Hydrochloride — Beta-eucaine hydrochloride.

BETA-EUCAINE LACTATE—Eucaini Lactas.

EUMYDRIN—Methylatropinæ Nitras—Atropinmethyl Nitrate.

EUPHTHALMIN—Euphthalmine Hydrochloride—Phenylglycolyl-Methyl-Vinyl Diacetonalkamine Hydrochloride.

FLUORESCEIN—Fluoresceinum—Resorcinolphthalein—Dioxyfluoran.

HOLOCAINE HYDROCHLORIDE—Holocainæ Hydrochloridum—Ethenyl-Paradiethoxy-Diphenyl-Amidine Hydrochloride.

ICHTHARGAN—Argenti Ichthosulphonas—Silver Sulphicthylolate—Silver Ichthylolate.

ETHYL-MORPHINE HYDROCHLORIDE—Dionin—Morphinæ Æthylatæ Hydrochloridum—Ethyl-morphine hydrochloride.

NOVOCAINE.

PROTARGOL—Protein Silver Salt.

SILVER CITRATE.

MERCUROL.

SILVER LACTATE.

STOVAINE—Benzoly-Ethyl-Dimethylaminopropanol Hydrochloride.

SUBLAMINE—Mercuric Sulphate-Ethylenediamine.

FIBROLYSIN.

TROPACOCAINE HYDROCHLORIDE—Tropococainæ Hydrochloridum—Benzoylpscudotropeine Hydrochloride—Tropeine.

That the reader's memory may be somewhat refreshed the Editor has taken the liberty of quoting a few sentences from his work on Ophthalmic Therapeutics, descriptive of some of the least known of the foregoing agents. Of *dionin, adrenalin, argyrol* and *protargol,* so much has already been written in these volumes that he has not considered it wise to repeat them.

A reference to *acoin*—the ocular remedy not included in "Non-Official Remedies"—has also been made and its medicinal actions discussed in this and other volumes of the Series.

Adrin. By this trade name is known *epinephrine hydrate,* one of the numerous *suprarenal capsule extracts.*

It is probably identical with *adrenalin chloride* and is used in the same dose, as a hemostatic and astringent.

Albargin. Gelatose silver. *Coarse, yellowish, shining powder,* very soluble in water; is a compound of silver nitrate with gelatose, containing 14 per cent. of silver. It is found in the market only in the form of 0.2 grm. (3 gr.) tablets.

In the absence of distilled water, dilute solutions of albargin may be made with the ordinary water supply. It is advisable, however, to prepare concentrated and stock solutions with distilled water and to protect them from light by storing the solutions in brown glass bottles. To dissolve albargin even boiling water may be used without decomposition as is the case with other albumen compounds of silver. If ordinary spring water is employed it should be added gradually to the albargin with occasional shaking, as with the contrary order turbidity may be caused; when distilled water is used, however, such a precautionary measure is not necessary.

Albargin stains on clothing are easily washed out with soap and water when fresh. Old stains, which have been exposed to light are easily removed with hyposulphite of sodium by steeping the articles of clothing in a *warm* 10 to 20 per cent. solution until the stains have disappeared.

For treatment of the eye 10 to 20 *per cent. albargin solutions in glycerin* are used. Twenty per cent. albargin glycerin solutions are also sold under the name of "Prophylactol."

This silver compound is regarded by Barnemann and others as superior to all other argentic salts in the treatment of infectious diseases of the eye. It is non-irritant but soon kills the various pathogenic cocci. It does not decompose on exposure to light and its solution gives a neutral reaction. It is used in 2 per cent. solutions wherever silver nitrate or protargol is indicated. It is sold in 3-grain tablets, 50 in a glass tube.

Alypin. This agent is derived from glycerin, *is closely related to stovaine* and has been strongly recommended as a substitute for cocain as a local anesthetic.

Alypin is the proprietary name given to one of those numerous, complicated, organic compounds, (mostly of

German origin) that have in recent years flooded the market. In 4 per cent. solution it acts as a valuable and safe anesthetic for ophthalmic practice, as it has the same action as cocain without causing mydrasis, disturbance of accommodation, increase of tension, drying of the cornea or intoxication. It is a white crystalline powder, soluble in water. We are indebted to Impens for its discovery.

Truc has compared the effects of both alypin and cocain of the same strength and is unable to find any appreciable difference, the toxic effect being less from alypin than cocain. With alypin there is no mydriasis, even with strong solutions. Tonus and accommodation are not changed by alypin. It is important that the solutions should be fresh neutral; old or acid ones being irritating.

When this anesthetic is used in conjunction with *silver nitrate, alypin nitrate* is to be preferred to the alkaloid. Owing to the fact that alypin is incompatible with silver nitrate it is not well adapted for anesthetizing mucous membranes to which nitrate of silver is afterward to be applied, as it may to some extent neutralize the effect of the latter through chemical decomposition. Alypin nitrate overcomes this difficulty, and is therefore recommended in such cases. Its chemical characters, solubility, and strength of solutions correspond essentially to those of alypin.

Merck's Reports for 1906 quote the experience of Landolt that the *anesthetic action of alypin is somewhat greater than that of cocain, but comes on more slowly.* As with the latter, the author has observed, after the instillation of drops of alypin, a transitory yet troublesome turbidity of the corneal surface with shedding of epithelium. An important point, however, is the fact that alypin is practically without influence on the pupil and on the accommodation. Kauffmann, therefore, *recommends the use of alypin whenever dilations of the pupil is to be avoided,* and whenever the accommodation is to be preserved unimpaired; and again when the intraocular tension is raised, or when it would be dangerous to risk a rise of tension. It is also indicated, however, according to the author, when the tissue cells need special care, and when considerable changes or defects are present in the corneal epithelium, and when, further, there is no objection to hyperemia at the corneal border, or in the conjunctiva. To produce anesthesia for the removal of foreign bodies, a 2-3 per cent. solution of alypin usually answers. The author gives the following as special indications for the use of alypin: Operations on the eyeball, operations for uncomplicated lenticular cataract, operations for glaucoma, herpes, keratitis bullosa, defects due to injury, infective separation of the conjunctiva and abscess of the lachrymal sac.

Sydney Stephenson makes the following emphatic statement regarding it: That he had never seen a bad result from 2 per cent alypin, despite the fact that from 1905 to August, 1908, it had displaced all other local anesthetics in his practice.

Sendral had good results with *alypin anesthesia in operations for senile cataract and secondary cataract.* In operations for chalazion, where he both instilled alypin solution and also applied it subconjunctivally, he did not obtain complete immunity from pain, because the anesthesia was slow to extend into the tarsal tissues. In operations for squint, also, the anesthesia was incomplete.

Argentamine. Liquor argentamini. This is a colorless 8 per cent. solution of silver nitrate or phosphate in a 15 per cent. solution of ethylenediamine, and corresponds to a 10 per cent. solution of the silver salt. It is astringent and antiseptic, like other silver salts, but it is said to be less irritating and more penetrating than the nitrate and is used wherever it is indicated.

Daxenberger was one of the earliest ophthalmologists to advise its use. He commends it in all cases of conjunctivitis, brushing a 5 to 10 per cent. solution over the everted lids. In addition to this a 3 per cent. solution is to be instilled. The writer prefers it in ophthalmia neonatorum; also in 3 per cent. solution as a prophylactic. He considers its value to be due to the fact that its bactericidal action is upon the subconjunctival tissues; that it is not superficial in action like most other silver salts.

Argonin. Silver sodio-caseinate. Prepared by adding silver nitrate to the sodium compound of casein. It is a fine white powder, containing about 4 per cent. of silver and is but slightly soluble in water.

Like argentamine it penetrates more deeply than silver nitrate and does not coagulate the albumin. In ophthalmia neonatorum and allied diseases it is used in 3 per cent. solutions; smaller doses in milder infections of the conjunctiva where silver nitrate is indicated.

According to Snellen, Argonin L. (*lösliches Argonin*), a newer preparation, is freely soluble in water and is found as a light yellow powder and contains 10 per cent. of metallic silver. According to Sellink it is markedly bactericidal.

E. C. Ellett, Trester Smith, Horace Bigelow and others have reported the satisfactory employment of this agent, in 5 and 10 per cent. solutions, instead of silver nitrate in the treatment of *purulent ophthalmia*—especially in gonococcal infections. The last-named observer believes that its easy solubility, deep penetration of the tissues, germicidal qualities and the fact that strong solutions do not require neutralization, make it an ideal remedy in the treatment of both infantile and adult gonorrheal ophthalmia.

Chloretone. A trichlorbutyl alcohol. $C_4H_7OCl_3$. Prepared from acetone and chloroform, it appears as snow-white crystals with a camphorus taste and odor. It is soluble in cold water to the extent of 0.80 per cent.; freely soluble in ether and oils.

This useful antiseptic and analgesic is often combined with cocain and other alkaloids, generally in the proportion of 2 per cent. It is one of the author's favorite remedies for the relief of the burning and smarting that so often accompany the lid hyperemias of eye-strain, in this combination:

Chloretone	0.10 grm.	(gr. 7-10)
Sodii boratis	0.50 grm.	(gr. 7½
Aquæ dest	30.0 cc.	(f℥ 1)

Collargol. Argentum Colloidale. An allotropic form of silver, said to consist of 86 parts of metallic silver, some silver oxid, and albumin. It is made by the action of sodium citrate and ferrous sulphate on nitrate of silver. Collargol occurs as black, scale-like pieces, soluble in 20 parts of water. It has been used in blenorrhœa neonatorum and other infective processes, but its chief use is in the preparation of Credé's ointment, which is composed of collargol 15 parts, water 5 parts, white wax 10 parts and benzoated lard 70 parts. In ophthalmic surgery it is a valuable antiseptic counterirritant, to be applied as a poultice to the lids in most serious cases of intraocular inflammation. The ointment is smeared on the closed lids and eyebrows at night, a bandage is applied and the greasy mixture washed off with warm water in the morning.

Eucain is chemically *allied to cocain* and used as a substitute for that anesthetic. It was first recommended by Merling. There are two modifications of this agent, eucain "A and B"—now called "Alpha-eucain" and "Beta-eucain" respectively. *Alpha-eucain* is a synthetic derivative of triacetonamine; *beta-eucain* is derived from vinyldiacetoneakalmine. Both are proprietary remedies and were issued by the same firm, but the latter is the one now recommended as a cocain substitute under the trade name Beta-eucain hydrochlorid or Eucain hydrochlorid-B. The drug does not blanch the conjunctiva and its instillations are occasionally painful.

In 1 to 3 per cent. watery solution Beta-eucain does not produce mydriasis or paresis of accommodation, is not poisonous and is less liable to decomposition than cocain and can be boiled without decomposing. The lactate is by several ophthalmologists, including Darier (*Therapeutique Oculaire,* p. 77), regarded as a desirable and efficient local anesthetic. It is much more soluble than eucain-B chlorid and quite as stable. In eye surgery it is used in 2 to 15 per cent. solutions. It enters, with suprarenalin, into the composition of *Eucapren.*

Eucain (Beta) Lactate. Benzoylvinyldiacetonealkalmine lactate. A white powder soluble in 5 parts of water, 9 of alcohol and 20 of glycerin. It is a valuable *local anesthetic* and owing to its greater solubility in water than *eucain* is preferred to it in many mixtures. Alone it is employed in from 2 to 15 per cent. solutions.

Eumydrin. Atropin methyl nitrate. Methylatropin nitrate. A white, odorless crystalline salt resulting from the action of atropin on methyl nitrate. It melts at 160° C. (325° F.), is readily soluble in water and alcohol; sparingly dissolved by ether.

This agent is employed as a *substitute* (although its action is about one-tenth weaker) *for atropia* on account of its non-toxic quality.

Goldberg noticed that a 1 per cent. solution acts from 5 to 8 minutes quicker than a 1-1000 solution of atropin, producing a dilatation of the pupil from 2.5 to 3 mm., and that its effect disappears toward the end of the second day, while the atropia mydriasis is still present on the fourth day. It acts more rapidly and thoroughly than homatropia solution of the same strength and its effects last about 12 hours longer. As a ciliary and iridic paretic agent it ranks between atropia and homatropia. In pathologic conditions the effects of a 1 per cent. solution seems to be about the same as that of 1 per cent. atropia solution, but it is not so lasting. Moreover, the drug produced no increase of pressure or other untoward phenomenon either in the normal or diseased eye.

Fibrolysin. A trade name for a sterilized solution of *thiosinamin* and *sodium salicylate,* containing 15 per cent. of the double salt. It is a colorless, aqueous solution and is interesting to us as a substitute for thiosinamin. It is marketed by Merck in sealed, brown-glass vials to prevent decomposition. As it readily decomposes on exposure to the air the bottle contains one dose only (equal to 0.2 thiosinamin), to be given subcutaneously. It is claimed that fibrolysin is more effective, is more quickly absorbed and causes less pain and irritation than thiosinamin alone.

Ichthargan. Silver Ichthyolate. Soluble silver sulphichthyolate. A compound of ichthyol and silver said to contain 30 per cent. of the metal and 15 per cent. of sulphur in organic combination. This agent is a brown, amorphous, stable powder with a chocolate-like odor, readily soluble in water, diluted alcohol and glycerin. It is affected by light and is incompatible with the soluble chlorids. For this drug the claim is made that, containing more silver than the other organic silver compounds lately introduced, it has a prior claim to our consideration in prescribing argentic remedies for purulent conjunctivitis, trachoma, etc.—especially where a nonirritating substitute for silver nitrate is desired.

Novocain. A complicated organic compound *introduced to supersede cocain,* especially in hypodermic injections.

It was first fully described and recommended by Braun. It crystallizes in small colorless needles, is soluble in its own weight of water and melts at 150° C. There is no irritation from its use even in concentrated solution, and the cornea will stand the powdered drug. As the anesthesia from novocain is comparatively brief (and for this reason is not likely when used alone to be a serious rival of other anesthetics) it is suggested that it be employed *hypodermatically with the suprarenal alkaloids.* Such a combination prolongs to a considerable extent its otherwise transient effects. The usual dosage ranges from 1 to 10 per cent.

Gebb[1] carefully studied the clinical and other actions of novocain and noted that it does not affect the width of the pupil in the less concentrated solutions. In 5 per cent. and 10 per cent. strength (excepting in 3 per cent.) a slight mydriasis is noted in the human subject after 10 minutes. The duration of the dilatation varies; it may be very brief or persist over an hour. The dilated pupil always reacts to light and convergence. If suprarenin is added to 1 per cent. or 2 per cent. solutions of novocain in 1-1000 strength, a difference in pupillary width is obtained but without complete paralysis.

In the cases investigated novocain exerted no influence on the accommodation; even after the instillation of large amounts of the 10 per cent. solution, a reading test showed that the action of the ciliary muscles was not affected.

The advantages of novocain over cocain lie in its capacity for sterilization by boiling, in its negative action on the accommodation and, finally, in its being much less toxic. It is relatively nonirritating and the burning sensation produced does not constitute a contraindication. The same is true of the slight degree of hyperemia and mydriasis noted.

Nevertheless, novocain, even after addition of suprarenin, *is inferior to cocain as an anesthetic for the eye.*

Wicherkiewicz[2] has made some important observations of

---

(1) Archiv. für Augenheilk., May, 1906.
(2) Wochen., für Therapie. und Hygiene. des Auges, Feb. 14, 1907.

the use of *novocain.* The drug was used in ½ per cent. solution and the author noticed that novocain anesthesia is somewhat slighter, but comes on as quickly and lasts as long as cocain anesthesia. It has no influence on the pupil or accommodation, and does not reduce tension. On the other hand, it seems to delay the healing of the wound in cataract extraction. Novocain is specially suited for the infiltration method when the tissues are inflamed. *Enucleation of a tender eyeball* can be carried out painlessly. For this purpose he recommends the following solution:

℞

Novocain	0.125
Suprarenin	0.00016
Sodii chlorid	0.225
Aquæ dest	25.00

Silver Citrate. Ag. $C_6H_5O_7$. A white powder or in acicular crystals, soluble in 4,000 parts of water.

As a collyrium this preparation has been used as an *antiseptic and astringent eyewater in the proportion of 1-10000 to 1-4000 of distilled water.* Solutions should always be fresh.

Gawalowski has also produced a soluble *carbonate of silver* which forms a clear, colorless water solution, having a neutral reaction and containing 0.25 gm. of silver in every 100 c.c. It will keep unchanged for several months if protected from the air, and may be used in place of the nitrate of silver. It is claimed to be nonirritant and to be decidedly astringent and antiseptic.

Silver Lactate. Ag $C_8H_5O_3+H_2O$. White powder or crystals. Much affected by light and should be kept in amber-colored bottles. Soluble in 20 parts of cold water.

As an *astringent* and *antiseptic* it is employed as a *collyrium* in the milder forms of *conjunctivitis with secretion,* in solutions of 1-4000 to 1-2000. The lids may be brushed with stronger solutions, ½ to 5 per cent., afterwards neutralizing with 5 per cent. sodium chlorid.

Most soluble salts of silver are *incompatible* with acetates, alcohol, alkalies, chlorids, copper salts, extracts, iodids, morphia and its derivatives, oils, organic substances, tannin and vegetable astringents, decoctions and infusions.

Stovain. This complicated organic compound occurs as small, brilliant, crystalline scales that melt at 347° F. (175° C.) and are very soluble in water. It is quite stable and its solutions may be sterilized at 115° C. without decomposition.

Of the *substitutes for cocain as a local anesthetic* this agent comes to us highly recommended, especially by Santos Fernandez. Its use should be limited to subconjunctival and subcutaneous injections, as in instillations it is not as effective as cocain. It is less than half as toxic as cocain. On account of its vasodilating property it should always be preferred to cocain in injections, as the latter, a vasoconstrictor, even though used cautiously, may produce precordial anxiety and pallor of the face, against which one is completely guarded if stovain is employed. One may operate while the patient is sitting upright without fear of synocope. It is commonly used in the eye as instillations in 4 per cent. solution; for hypodermic or subconjunctival purposes in 0.75 to 1 per cent. acqueous solution.

Darier[1] believes that this agent is but slightly toxic and when given hypodermically does not act as a depressant. On the contrary, it is a heart tonic, augmenting the intensity of its contraction. As a local anesthetic it is, perhaps, *in equal dose less effective than cocain;* but in anesthesia by infiltration the latter agent might easily be discarded for the same percentage of stovain. It is also a decided antiseptic.

The instillation of stovain solutions is *more painful* than that of cocain. Darier uses with the very best results a mixture of *equal parts of acoin, stovain and cocain,* both for operation on the eye and for other purposes. He finds that corneal anesthesia is brought about most rapidly by the following mixture:

℞

Adrenalin hydrochlor, 1-1000	gtt.x
Stovain	
Cocain. hydrochlor. āā	0.10
Sol. sodii chlor (1 per cent.)	5.00

---

(1) **Thérapeutic Oculaire, p. 86.**

He believes it to equal cocain as a local anesthetic and advises its use in 2 to 4 per cent. solutions, which when boiled retain their power. It has a disagreeable odor, a bitter taste and is a feebler mydriatic and cycloplegic than cocain. Like *alypin* (q. v.) it is a vasodilator. It acts as a decided irritant when combined with adrenalin in hypodermic or subconjunctival injections.

Sublamine. Occurs as white crystals easily soluble in water and glycerin and contains about 44 per cent. of mercury. In collyria it is usually ordered in 1-5000—3000 solutions.

It is a mercuric ethylenediamin sulphate and is said by Blumberg to have the greatest power of tissue penetration (with the minimum effect upon the skin) of all the mercurial salts. It is less poisonous than corrosive sublimate and its disinfectant quality is at least equal. Furthermore, corrosive sublimate frequently causes eczema of the skin, while sublamine does not. This is important, since exact experimentation has shown that the very slightest roughness, the most insignificant scaling of the skin, make an efficient disinfection of the parts more and more difficult. In this connection since, as Schleich, Gottstein, Haegler and others have shown, a sterile condition of the hands is the first desideratum in efficient operative work, and for that reason when a mercuric salt is employed for the purpose sublamine, even in concentrated solutions (in which state sublimate cannot be employed at all) is not contraindicated.

Imre,[1] who made some of the earliest observations of this germicide, investigated its value as a *conjunctival disinfectant.* He found it to be valuable in the various forms of *suppurative conjunctivitis.* In this connection he reminds us that regular cleansing of the conjunctival surface is the most important element in the treatment of these cases, *i. e.*, everything depends upon the frequent removal of the accumulated secretion. The earlier it is begun the greater is the likelihood that it will save the cornea. But even when begun late, irrigation is of the greatest importance. Though the noxious substances or bacteria under the conjunctiva or even in the corneal tissue

---

(1) **Die Heilkunde, September, 1903.**

cannot under these circumstances be reached by the fluid, it is always essential to prevent their stagnation in the conjunctival sac. In some cases the fluid employed for irrigation is of no consequence; hence in chronic cases such as trachoma a 1 per cent. salt solution suffices. But in acuter cases, with abundant suppuration, as, for example, in gonorrheal conjunctivitis, a bactericide action is absolutely necessary. Abundant experience led him to affirm without hesitation that the desiccating action of simple irrigation fluids that are neutral as regards temperature and concentration, is by no means equal to that of really bactericide remedies. Unfortunately, however, there is no direct relationship between disinfectant power and therapeutic action; the sensitiveness of the conjunctiva must be reckoned with and chemical irritants avoided; for increased secretion in consequence of irritation much more than counterbalances their transitory good effects. Here a 1-1000 sublimine solution answers admirably, being readily borne and hardly causing prickling, redness or mucous secretion in the healthy conjunctiva.

In *acute gonorrheal conjunctivitis* the instillations were made every half hour from an undine onto the everted lids; where that was not possible the lids were opened as far as this can be done with the fingers or with retractors. Fifty to 100 grams (1½ oz. to 3 oz.) were used each time, and the treatment kept up day and night. Occasionally the instillations were made oftener, to obviate the stagnation of the pus; but experience has taught that too frequent irrigation, no matter with what, causes the formation of pseudomembranes. So for that matter do all other procedures, which occasion too rapid death and desquamation of the epithelial cells, cause hyperemia and fibrinous exudation.

In other cases of severe infectious conjunctivitis, which are often caused by the Koch-Weeks bacillus, and generally in all cases of fresh catarrhs, sublamine compresses and irrigations are more effective than boric acid or the employment of lead or zinc. The secretion disappears more rapidly and the conjunctiva thins quicker. Painting with a weak nitrate of silver solution, or better with argentamine, must not be omitted; otherwise the later stages of the disease, when the violent irritative symptoms have disappeared, may be much protracted.

Tropacocain. Benzoyl-pseudotropin. This alkaloid occurs as colorless crystals and is found in the leaves of Erythroxylon coca, the Java coca plant. It differs chemically from cocain and has decided myriatic powers.

The hydrochlorid is generally prescribed. It is *best combined with 0.6 per cent. sodic chlorid* in 1 to 4 per cent. solution. It is cheaper, more stable and more easily sterilized than cocain, while its anesthesia occurs more rapidly and lasts longer. On the other hand, it is quite poisonous and not more than half a grain (gm. 0.03) should, on that account, be used for injection anesthesia.

THE EAR.

THE EAR.

MIDDLE EAR.

CATARRHAL DEAFNESS.

Nasal Analgesia as a Symptom. Dunbar Roy[1] calls attention to nasal analgesia as a prognostic symptom in dry catarrhal deafness. All rhinologists are familiar with the fact that the sensitiveness of the nasal mucosa varies with individuals under different conditions of the membrane itself. This may be accounted for on the basis of temperament, the phlegmatic individual being much less susceptible to this sensitiveness than those of nervous temperament. On the other hand, this lack of sensitiveness of the nasal mucosa will be found in varying degrees among patients who suffer from progressive deafness of the dry variety, in the study of which we will often find that it is not due to the temperament of the patient. The analgesia referred to in these individuals is not confined to the nasal cavities, for we also find it present in the ear itself. For instance, what patients with normal hearing apparatus could stand the use of the Lucae probe on the drum membrane, or even other instrumental manipulations in this region? That the same pathologic causes which produce this condition in the nasal cavities also act on the aural apparatus, is evident. What these changes are must yet be determined. Branches from the same nerve trunk supply both organs with sensibility, and whether or not the same degenerative and hypertrophic condition which exists in the cases of progressive deafness of the middle ear, is also present in the sensitive nerve terminals themselves, must as yet be determined.

He is convinced that this form of progressive deafness is a condition *sui generis* and that the mucous membrane in the nose, nasopharynx, Eustachian tube and middle ear, undergoes the same pathologic changes that are found in the nerve terminals which supply these parts. The more advanced are these changes in the mucosa and nerve terminals, the less favorable is the prognosis regarding the improvement of hearing. These same degenerative changes also finally take place in the auditory nerve itself, as is evidenced by the tuning-fork test and the histopathologic investigations of Moos, Politzer, Gruber and others. If, then, such changes do take place, which fact, of course, has not yet been conclusively shown, it would certainly seem to follow that a lack of sensibility in the nasal cavities means also a lack of sensibility in the middle and internal ears, with some changes in the auditory nerve itself. Basing the argument on these premises, it would also indicate that the more insensible to irritation a part is, the less likely is it to be restored to normal sensibility. This certainly seems to be a law of our physical constitution, manifested in various pathologic conditions of the human frame. He finds that this symptom is of decided prognostic value, for the results of treatment have uniformly been better when there existed a normal or even abnormal sensibility of the mucous membrane, than when there was decided nasal insensibility.

---

[1] **Jour. Am. Med. Assoc., Aug. 22, 1908.**

Treatment. In discussing the problem which confronts otologists in the treatment of chronic catarrhal deafness, C. M. Cobb[1] states that the reason for the failure of other operations upon the nose and nasopharynx to produce the brilliant results obtained from the removal of adenoids, is due to the mistaken idea that the effect of the nose and nasopharynx is caused by mechanical interference with proper ventilation of the Eustachian tube. If we look upon the congestion of the Eustachian tube and middle ear as active and due to infection rather than passive and due to mechanical obstruction, we shall be in a position to render these patients more assistance. He believes the most common cause of Eustachian occlusion is obstruction to drainage from the ethmoid cells, and that he has discovered a peculiar formation of the middle turbinal which

---

(1) Medical Record, May 16, 1908.

is an active factor in this obstruction. When seen by anterior rhinoscopy, the middle turbinal presents a well-marked picture. In the first stage the nasal chambers are rather narrow and generally free from signs of disease of the mucous membrane; the nasal chambers as they form the apex of the triangle superiorly are extremely narrow, and the middle turbinal is not at all prominent in front, but does extend downward in its posterior part, often below the inferior turbinal. The prolongation downward of the posterior part of the middle turbinal is often extremely thin on its front edge, but if investigated it will be found that it immediately grows thicker, and if the attempt is made to introduce a probe between it and the septum it will be found that it is very difficult and many times almost impossible. It is generally as closely applied to the outer nasal wall. The membrane does not have the appearance of congestion or inflammation in the first stage of the disease, but that part of the nose is thoroughly blocked by the bony enlargement of the middle turbinal. It forms such a tight wedge that it is often difficult and sometimes impossible to introduce the blades of the ethmoid forceps on either side of it when one attempts to remove a portion of it. The stage of the disease which is marked by this enlargement of the middle turbinal is closely associated with the beginning and progressive stage of the middle-ear disease. Before atrophy takes place he believes that it is possible to arrest the deafness by removing a part of the prolongation of the middle turbinal.

Adenoids in Causation of Ear Diseases. F. E. Emerson[1] thinks adenoid vegetations in the fossæ of Rosenmueller have an important relation to diseases of the ear. Clinically he finds these vegetations arranged as follows:

1. One or more bands pass from the posterior and upper part of the recessus pharyngeus to the Eustachian tube. These can be seen by post-rhinoscopy.

2. The entire fossa is filled with a soft, friable mass, which is sound and which cannot be seen by the eye. The finger, however, sinks into and easily removes it. In this class the recessus is deep and there is a large amount of

---

(1) Annals of Otol., Rhinol. and Laryngol., September, 1907.

tissue, which bleeds almost as freely as at the average adenoid operation.

3. The recessus is studded with irregular masses which may be scattered, though not large in amount. Objectively, then, we do not have anything pathognomonic, as this condition may be associated with chronic secretory or suppurative otitis media, and locally it can be detected only by digital examination. Clinically, however, there is a very definite picture. These patients complain not so much of absolute as of relative deafness, i. e., their hearing fluctuates and is influenced by changes in weather, dust and by physical conditions. They feel as though there is something over the affected ear or ears. There is tinnitus and referred abnormal sensations in the throat. The hearing test is normal for a long time. If they have an acute infection it recurs constantly on the same side.

The correction of abnormal conditions in the vault does not protect the patient from subsequent attacks of salpingitis. These are the cases that have obtained temporary relief by the use of silver nitrate to the vault, and catheterization, or, if there is a more acute condition, the Politzer bag. As in the nasopharynx, all palliative measures are being supplanted by surgical procedures; so here is one more reason for discontinuing the use of the much-abused catheter. That the Eustachian tube will open physiologically and remain open, if we can prevent or cure inflammations of the tissues about its orifice, is the trend of opinion among otologists. Those who hold this view find less indications for continued treatment by inflation.

He offers the following conclusions:

1. Pathologic amounts of lymphoid tissue are present in Rosenmueller's fossæ in a large number of cases of chronic secretory and suppurative ears.

2. This cannot be detected with certainty by postrhinoscopy alone, even where a good view of the vault is obtainable.

3. In every chronic case there should be a routine digital examination.

4. Where much tissue has been found and removed, the process of healing should be watched, that no fibrous bands form.

5. It is possible in a large majority of cases to predict

the involved ear by the condition of the corresponding fossa.

6. Results where after treatment is followed are particularly good in removing abnormal sensations, restoring uniform hearing without fluctuations in the partial or complete relief of tinnitus, and in the prevention of recurring salpingitis.

7. If directions are given to blow one side of the nose at a time, carefully, the affected tube is no more apt to be infected later than its fellow.

Pneumo-Massage in Ear Diseases. M. Yearsley[1] has used pneumo-massage in 152 ears. In this series were 30 of otosclerosis, 117 of chronic middle-ear catarrh, and 5 were sequelæ of middle-ear suppuration.

In one case of otosclerosis both ears were temporarily improved, while the tinnitus was unaffected. In one other case the hearing was improved for the whisper from 24 to 85 inches, and this improvement was maintained for at least three months. Eighty-six of the 117 cases of chronic middle-ear catarrh suffered from tinnitus. Permanent improvement in the hearing occurred in 50 ears, and the tinnitus was diminished in 40 out of 86, and completely relieved in 20. In 5 cases of fixation of the malleus the bone was mobilized under nitrous oxid anesthesia, and pneumo-massage used to maintain the recovered mobility.

In all these cases massage was used as an adjunct to inflation and intratympanic injections. In several cases, however, it was not started until other methods, especially inflation, had been given a trial. In one case catheterization failed to improve the left ear after a fortnight's daily application, although it greatly improved the opposite ear. Immediately after the massage was commenced, the left ear began to improve and hearing acuity was considerably augmented thereby. In one other case other methods of treatment resulted in moderate improvement. Tinnitus, which was troublesome, remained unaltered. On using massage, the hearing was further improved, and tinnitus ceased. The patient purchased a water-power masseur and finds that it gives her relief whenever she begins to lose ground.

In 14 cases, or 24 ears, marked improvement commenced

---

(1) Jour. Laryngol., Rhinol. and Otol., October, 1907.

only when massage was used, although inflation had been already given a fair trial. It is the writer's opinion that pneumo-massage is of most value in that stage of chronic middle-ear catarrh when the ossicular chain is first becoming restricted in its movements. Contrary to the general expression of opinion, he is inclined to look upon paracusis Willisii in chronic middle-ear catarrh as rather an indication for treatment than as a bad symptom.

As regards application of pneumo-massage, he says: "Rapidity of vibration is much more important than length of stroke. In any case, I would not advise a piston excursion of greater extent than 2 mm., or at most 2.5 mm. The first application with the hand masseur should last ½ minute; with the electro-motor-masseur, which at its lowest speed runs 3,000 vibrations per second, 5 to 10 seconds are sufficient. Both speed and length of application can then be gradually increased, the latter up to 2½ minutes, the former to 6,000 or 9,000 vibrations; I have found no advantage in going beyond the latter speed."

OTITIS MEDIA.

Running Ears. J. F. McKernon[1] strongly urges the importance of teaching the undergraduate in our medical colleges more about aural disease, and particularly the gravity of a running ear, so that when this class of case presents itself to him for advice and treatment, appropriate measures may be instituted for its relief. It is mainly in this way that we may hope in the future to diminish and limit the intracranial complications of otitic disease.

Relation of Nasopharynx. W. S. Bryant[2] emphasizes the importance of looking after the nasopharynx in acute otitis media with or without mastoid involvement.

Constitutional conditions alone are not sufficient cause of mastoiditis. These conditions serve only to aggravate the local defects.

The method of action of the local predisposing factors is fourfold. First, direct mechanical obstruction to the Eustachian tube; second, direct interference with the circulation of the Eustachian tube, causing congestion; third, reflex vasomotor disturbances of nasopharyngeal origin

---

(1) Jour. Am. Med. Assoc., Jan. 9, 1909.
(2) N. Y. Med. Jour., Jan. 31, 1909.

which may affect the middle ear and mastoid cells; fourth, the impairment of the activity of the ciliated epithelium and of the bactericidal properties of the mucous secretions.

The protection of the patient from mastoiditis, therefore, depends upon a perfect physiologic condition of the upper air tract. This is best maintained by good hygiene. This desirable condition may be attained when any structural or functional defect is present, by operative or medical intervention. Operative treatment is necessary when the conditions have passed beyond simple functional disturbances with structural and tissue abnormalities and degenerations. Where the functions alone are at fault local applications will be found of benefit. Mastoiditis occurs but seldom—in fact, almost never—where some of the local conditions which have been cited before are not present. In general diseases, even in the exanthemata, the preservation of a normal upper air tract will safeguard against mastoiditis. The same holds good in coryza, pneumonia, tuberculosis, typhoid fever and influenza.

In order to be effective the preoperative treatment should begin before the signs of mastoiditis have become marked, as after this it is too late. The sooner an operation is performed the better for the patient with mastoiditis and otitis. As soon as infection of the middle ear appears, or is even suspected, preventive treatment is in order. Our efforts should be directed to assisting Nature and preserving the functions of the Eustachian tube. This is brought about by nasopharyngeal aid, through the use of astringent and antiseptic applications, such as adrenalin, Dobell's solution, silver albuminoid compounds or weak nitrate of silver. Occasionally the assistance of nasopharyngeal operation is needed in special cases. As a rule we require more drainage than we can expect from the tube; consequently we must incise, not puncture the drum membrane. The patient with the signs of beginning mastoiditis should receive the same careful attention as the patient with the symptoms of appendicular inflammation. Rest in bed should be insisted upon, a saline purgative given and local treatment promptly begun. Hot rather than cold applications over the mastoid process are to be preferred. The hot water ear bag or a hot salt bag (doughnut shaped, because pressure over the auricle is apt to be painful) should be used. Hot douching with a saturated boric solution, as hot as the patient can tolerate without discomfort, should be frequently repeated for the middle ear—every hour while the patient is awake. The hot douching is especially useful in the cases where there is much swelling and congestion.

Under the head of preoperative treatment we must include cupping, blood-letting and Wilde's incision; the latter, as you are aware, being an incision through the skin and periosteum over the mastoid process. A wet antiseptic dressing should be kept upon the wound until it is healed. symptoms of otitis media in infants as follows:

Symptoms. Dr. A. J. Herzig[1] classifies the objective symptoms of otitis media in infants as follows:

A red, angry, bulging membrane is seen upon careful examination. Very often one sees a bulging of the posterior portion of the tympanic membrane, or only the congestion of the upper third, and sometimes one only sees a congestion of Shrapnell's membrane. All of these lead to a diagnosis of acute otitis media. Very frequently a physician examines an ear and finds what appears to him a white membrane, which, if carefully and delicately swabbed, will reveal an angry, red, bulging ear drum. This white coating is caused by drugs used by the parents or doctors, or by the secretions of the ear. Infiltration of the canal wall occurs in infants, so that it is often impossible to introduce a small speculum; hence we fail to see the eardrum.

The subjective symptoms observed are:

1. The temperature is one of the most reliable and constant symptoms that we have. If during the convalescence of an infant from one of the infectious fevers the temperature suddenly rises, examine the ear and you will frequently find the cause of the trouble here. Also in gastroenteric diseases, when the patient is improving but the temperature remains high, examine the ear, and in 95 per cent. of the cases you will find an acute otitis media the cause of the temperature.

2. Pain is the most inconstant symptom we have in acute otitis media in infants. Kerley, 1901, reports 77 cases, of which number there was a total absence of pain and tenderness in 69 per cent., and yet these infants all suffered from an acute otitis media. In cases where pain is

---

(1) N. Y. Med. Jour., March 14, 1908.

present it is shown by the short, spasmodic cry of the infant, which is increased by pressure upon the auricle and in the angle of the lower jaw.

3. Extreme restlessness is a very constant symptom in infants, being present in over 90 per cent. of the cases. In cases of gastroenteritis we often see extreme restlessness as the only symptom of an acute otitis media.

4. Refusal of the child to rest its head upon the affected side was brought to notice by Dr. Marsh in 1897. This is not a constant sign, as it appears in only about 50 per cent. of cases.

5. Tenderness upon pressure, which is a constant symptom.

6. Enlargement of the glands under the angle of the jaw is fairly constant. Of 248 cases in the author's experience glandular enlargement was present in 189 cases, or 76 per cent.

7. A nasal discharge was present in 136 out of 248 cases, or 54 per cent. This discharge is generally of a glairy muscoid character, but oftentimes mucopurulent.

8. Gastroenteric symptoms, such as diarrhea and vomiting, occur.

9. Convulsions occur in a small percentage of cases, and take the place of the chill which we get in older children and adults.

Symptoms in older children are the same as those enumerated for infants, except that the element of pain plays a greater role than in infants, and is a far more constant symptom. Nausea is also a symptom often seen in older children. These children complain frequently of a fullness of the head. Anorexia is present in most of the cases in older children.

Gastrointestinal Disturbances as a Symptom. L. Fischer[1] discusses gastrointestinal disturbance as a symptom of acute middle ear suppuration. He believes that the ear disease and the resulting gastrointestinal symptoms are caused by the development of microorganisms in the mouth and nasopharynx, and that the usual bacteria responsible for these conditions in children are the pneumococcus and the streptococcus. The pathogenic bacteria enter with the air and nasal secretions through the nose into the Eustachian

---

(1) N. Y. Med. Jour., Feb. 29, 1908.

tube. In like manner an infection can take place from the pharynx or by infectious secretions from the bronchi. During the act of vomiting it is easy for pathogenic bacteria to gain entrance to the middle ear through the Eustachian tube. The acts of sneezing, yawning, coughing, swallowing and muscular action, associated with regurgitation of food, especially while the child is in the dorsal position, are all conditions which should be remembered in seeking the source of an infection. The ease with which nurslings vomit seems to call for especial stress. Fluids will frequently be expelled through the mouth and nose. If, therefore, the nose is obstructed by accumulated secretions, and there is a damming back of decomposed food in the rhinopharynx, bacteria, if present, can be forced easily into the Eustachian tube.

Diarrhea may be due to Nature's method of eliminating poisons stored in the body. If a child suddenly shows gastric disturbances, and if the food suddenly disagrees, then the temperature should be taken. In addition to the careful examination of the stomach and intestines, the nose and throat should be examined. No diagnosis should be considered complete until the throat, and especially the ears, have been examined. The symptoms of an otic infection may so resemble an acute milk infection that only careful examination of the ears can determine the correctness of such diagnosis.

The gastrointestinal symptoms due to the toxemia resulting from a pneumococcus infection or a streptococcus infection of the middle ear appear in the following manner:

In breast-fed infants there is usually a history of some member in the family having had the grip. The infant up to this time has been enjoying excellent health. It is suddenly taken sick. The human milk causes dyspeptic symptoms, such as vomiting, diarrhea, greenish or curded stools, and anorexia. The infant turns away from the breast, and the mother in her anxiety to feed the baby commits the dietetic error of too frequent feeding. Accompanying these symptoms there is a marked febrile disturbance. The temperature may be 101 F. and rise to 104 F., or even 105 F. The pulse rate is accelerated and may reach 130 or 140. The pulse never intermits as it does in tuberculous meningitis. The respiration is also increased and is usually between 30 and 40 per minute. There is no cough present, and there are no distinct evidences of pulmonary involvement. The surface of the skin feels hot and the head is flushed. At times an erythematous or an urticarial eruption will be found on various parts of the body, chiefly confined to the face, thorax and abdomen. This punctate eruption lasts from 3 to 4 days. The infant has a marked apathetic condition and moans at times as though in pain. The stomach and abdomen appear distended and percussion shows marked meteorism. The flatulence is also evidenced by frequent eructations as well as by the expulsion of flatus. The tongue is coated with a whitish fur. The pharynx and tonsils appear red and congested, but there are no visible patches. There is a marked odor of acetone perceptible from the breath. The cervical glands are not involved.

The clinical manifestations in an infant, brought up artificially, are usually more intensified. The same clinical picture of nausea, vomiting, fever and gastroenteric disturbances will also be found. In addition thereto the temperature may reach 105 F. at the very beginning and the symptoms may be ushered in by convulsions. There may be grinding of teeth. The stools, which until now have been of a uniform consistency, show evidences of enterocolitis. They are either green or muddy and contain mucus and undigested particles of food and are foul smelling. They are accompanied by large quantities of gas. From the irritation of these acid stools there may be an excoriation around the anus and the buttocks are usually red and inflamed. The urine shows a high gravity and acetone in addition to quantities of indican, the latter indicating a disturbance of metabolism due to putrefactive absorption. The gastric symptoms will continue in spite of careful dieting. So also undigested particles of food will be found in the stool, showing the effect of the toxin on the glands of the stomach and intestines. When intestinal digestion is impaired, in spite of eliminative treatment and careful dieting, it proves that the seat of the trouble is located elsewhere. An examination of the blood in a doubtful case of prolonged fever may at times reveal obscure suppuration. If the polynuclear percentage is very high it speaks for the presence of pus. The fever curve is one that shows wide variations similar to what we find in tuberculous meningitis.

As a rule the symptoms are more pronounced in the marasmic or atrophic child. The paper does not go into the details of secondary infections resulting from the acute exanthemata further than to say that an associated ear complication must always appeal to the physician, and hence as a routine method of watching the urine is demanded, so also must the ear be carefully supervised by the attending physician or by an aurist, if necessary.

In a normal infant during the act of crying or screaming the drum membrane appears pink or rose colored. It is advisable, therefore, to examine the ear gently and quickly while the infant is asleep to prevent its waking and crying.

Leucocytosis in Relation to Infections in the Temporal Bone. S. MacCuen Smith,[1] in considering bacterial invasion of the temporal bone and the adjacent structures, speaks of the presence and value of leucocytosis. In this connection it is well to remember that a leucocytosis is a perfectly normal condition in the healthy state, and is, in fact, nature's method of providing scavengers for the destruction of the numerous microorganisms that are constantly invading the human economy. This leucocytosis, therefore, must necessarily vary in degree, depending entirely on the quantity and character of the toxins to be destroyed.

In the great majority of cases a normal leucocytosis is quite sufficient to destroy the hostile microbic incursion, but when the pathogenic organisms are numerous and virulent a battle royal ensues between the leucocytes and the invading microbic army. In order to successfully meet and destroy the enemy nature greatly increases the normal percentage of leucocytes, in which state the term hyperleucocytosis should be used, the antithesis being hypoleucocytosis, or leucopenia, which naturally signifies an entirely different condition. The normal number of leucocytes varies from 6,000 to 10,000 to the cubic millimeter. Hyperleucocytosis indicates an increase to 15,000 or more, and

---

(1) Therap. Gazette, Oct. 15, 1908.

hypoleucocytosis, or leucopenia, is a decrease from the normal amount.

An examination of the blood is often an important link in the chain of symptoms which goes to make up the diagnosis in a septic process, but this examination must consist of the differential leucocyte count as distinguished from merely determining the presence of a hyperleucocytosis on the one hand, or leucopenia on the other.

The condition in sepsis, in the majority of cases, shows a decided increase in the leucocytes, but this is by no means constant, for as great an authority as Grawitz states that "Not rarely active inflammatory processes with suppuration may be present without hyperleucocytosis occurring."

Leucocytosis gauges the combative powers an individual possesses and can use against the infection by which he is attacked, but it does not show the strength of that infection. Thus, in trifling infections in which the activity of the leucocytes is insufficient, and also in fatal cases in which the system is overwhelmed by the toxins, hyperleucocytosis does not develop and even leucopenia may be absent. Facts such as these render the occurrence of hyperleucocytosis in sepsis an inconstant phenomenon. An early development and rapid increase in the number of leucocytes is decidedly in favor of septic disease. We have, however, a good index to the severity of the septic process in the relative percentage of polynuclear leucocytes. Normally there is present a variation of from 59 to 68 per cent. of these cells, with a mean percentage of 61. Therefore, if a patient presents a blood picture in which the relative polynuclear percentage is above 80 it indicates absorption of pus from some part of the body. Pus is seldom found with a relative percentage of less than 80, unless the patient is a child, in which case it may be as low as 73. However, pus should be suspected and looked for in all cases in which the polynuclear percentage is above 70.

In addition to the hyperleucocytosis there is at times another element which may be determined from the examination of the blood, namely, the demonstration of the special microorganism, often in almost pure culture. It is never sufficient to content ourselves with a single culture of the blood, but this should be repeated, and, in addition, various culture media should be employed.

The relations of the ear to sepsis are extremely important. Ponfick examined the ears in 100 children whose ages varied from 1 month to 4 years, and who had succumbed to various diseases. The autopsies revealed that 78 times there was bilateral and 13 times unilateral otitis media. In only 9 cases was the middle ear normal.

From the foregoing it would seem that we have at our command a valuable asset, which, when properly worked out, may throw much invaluable light on certain forms of sepsis. For example, in cases of recurrent suppurative otitis media, during the stage of *apparent* inactivity, or, in other words, between the periods that mark the acute exacerbations, it may be possible, by an examination of the blood, to demonstrate that a retrogressive metamorphosis is in actual process. The value of such findings would at once become apparent if we were enabled thereby to appreciate such conditions, even in the absence of certain localizing symptoms.

Extratympanic Complications of Otitis Media. W. S. Bryant[1] enumerates the extratympanic complications of otitis media, some of which are common and some exceedingly rare. 1. Extensive cholesteatoma eroding the temporal bone and invading the cranial cavity. 2. Extensive caries of the temporal bone with formation of large sequestræ, often including the osseous labyrinth. 3. Mastoiditis or inflammation of the mastoid antrum and cells. 4. Osteomyelitis, or inflammation of the bone and red marrow, usually commencing in the bone of the mastoid process, extending through the temporal bone and invading the adjacent parietal and occipital bones. 5. Perimastoid cellulitis, inflammation of the tissues covering the mastoid region by direct extension from within. 6. Subperiosteal abscesses occur on the face of the mastoid and caused by the pus from within the bone dissecting up the periosteum. 7. Mastoid fistulæ, usually multiple, caused by spontaneous drainage of deep-lying bone suppuration. 8. Deep cervical cellulitis, caused by escape of pus from the base or inner surface of the mastoid region, and descending down the neck within the deep fossæ. The pus may penetrate into the mediastinum and pleural cavities, thus caus-

---

(1) N. Y. Med. Jour., Oct. 17, 1908.

ing a very serious complication. 9. The tympanic inflammation may attack the labyrinth by invasion of the external semicircular canal or by penetrating through the fenestræ and causing suppurative labyrinthitis. This is a most dangerous complication, since, besides destroying the auditory and equilibrative functions of the ear, it is very apt to cause leptomeningitis and death. 10. Pachymeningitis is a very common complication of extensive mastoiditis and osteomyelitis. It is not in itself dangerous, but it leads the way for the infection to enter the most vital structures, the pia mater and the sigmoid sinus. 11. Epidural abscess is the result of pachymeningitis; it is a dangerous complication, because of the proximity of the abscess to the arachnoid and sinus. 12. Perisinuous abscess is a complication of an epidural abscess which involves the region of the sinus. This is dangerous because of the threatened extension into the sinus. 13. Sinus phlebitis, one of the most dangerous complications, is due to the extension of the infection into the wall of the lateral sinus, sigmoid sinus, or bulb of the jugular vein. First a parietal thrombus forms over the infected area. This thrombus may increase until it occludes the vessel and may extend in both directions. It may later break down and become purulent. Sometimes the infection of the sinus wall and jugular vein wall extend far beyond an occluding thrombus. In these cases the infected vein or sinus is lined by a mural thrombus. 14. When the virulence of the infection is great and the resistance of the individual slight the local toxic effect of the infection may be sufficient to cause necrosis of the meninges at the focus of infection on the dura mater, resulting in gangrene of the meninges and adjacent structures, including the dura mater, sinus and brain tissue. This condition is usually fatal. 15. Cerebral abscess is an important extratympanic complication of middle ear suppuration. It may arise from direct extension of the infection through the tegmen and dura or it may follow the course of the veins and lymphatics and macroscopically have the appearance of a metastatic abscess. The cerebral abscess usually originates in one of two ways: either by direct extension through the dura mater in the neighborhood of the sigmoid sinus, or by extension from an infected labyrinth. In the latter case the infection penetrates through the internal auditory meatus, and instead of causing purulent leptomeningitis of the cerebellar fossa, causes an abscess of the adjacent cerebellar lobe. 16. Serous meningitis is an inflammation of the meninges which has not developed into suppuration. Its dangers are compression of the cranial contents and final suppuration. In either case death may result. 17. Purulent leptomeningitis may be due to direct extension from the middle ear or to a secondary extension from the temporal bone and dura mater. In the middle cranial fossa it usually commences at the tegmen tympani. In the cerebellar fossa it usually commences by extension through the internal auditory meatus or by extension from the neighborhood of the sigmoid sinus. 18. Encephalitis is a diffused infection of the brain tissue; its origin is the same as that of brain abscess, but its course is more acute. 19. Cerebrospinal meningitis is a complication caused by the extension of leptomeningitis or by the extension of the infection into the lateral ventricles and spinal cord. 20. Middle ear suppuration and its complications, especially sinus thrombosis, may give rise to metastatic suppuration in the large joints and pleural cavities and other lymph spaces; also abscess formations in distant cellular tissue and organs. Sinus thrombosis occasionally gives rise to septic pulmonary emboli, which cause pulmonary infection and necrosis. 21. The bacterial poisons absorbed from the infected ear or its complications may be sufficient to cause a fatal septic fever. 22. Bacteremia, if the bacteria gain entrance to the blood, may follow suppurative otitis and its complications. Bacteremia indicates very low opsonic resistance and is usually fatal.

Indications for Surgical Interference. F. Cohn[1] discusses the indications for surgical interference in acute otitis media of infancy and childhood. He notes two general types of acute otitis media as recognized by pathologists; *i. e.,* otitis media catarrhalis simplex acuta and otitis media acuta mucopurulenta sive purulenta. In the former the exudate is usually serous or mucous in character; in the latter the discharge is always mucopurulent or purulent. The simple catarrhal otitis represents a lighter form of inflammation; the latter a graver one. From the bacteriologic standpoint this distinction does not entirely hold, as we now recognize a streptococcic form of invasion, for instance, which may give a serous exudate accompanied by complications fully as severe as the mucopurulent or purulent types of inflammation. A practical subdivision, from the surgical point of view, and usually accepted, recognizes a nonperforative and a perforative form of inflammation.

---

[1] N. Y. Med. Jour., Feb. 29, 1908.

We speak of a middle ear inflammation as being perforative if a *restitutio ad integrum* is impossible without artificial or spontaneous vent having been given to the exudate contained in the tympanic cavity. The acute catarrhal inflammation is usually a nonperforative form; the exudate is usually mucopurulent or purulent. If we bear in mind these facts the formulations of our indications for paracentesis are almost obvious and we can logically conclude that—

1. Paracentesis is indicated in every form of perforative inflammation.
2 Paracentesis is not indicated in the nonperforative form of inflammation.
3. Paracentesis should be performed in every doubtful case in which distinction is impossible or difficult, and whenever immediate depletion and diminution of tension in the tympanic cavity appear advisable.
4. Not to perform paracentesis too early, unless some aggravating symptoms demand such interference.

Conservative Treatment. O. Körner[1] says it is only since the introduction of the radical mastoid operation that we have begun to speak of the conservative treatment of middle-ear suppuration, which includes all therapeutic measures that can be carried out through the natural passages—the external auditory meatus and the Eustachian tube—even when these include surgical operations such as the removal of diseased ossicles. In recent years every chronic middle-ear suppuration is not regarded as dangerous to life, because the radical operation—a sort of autopsy on the living—has taught us to recognize the difference between the dangerous and the harmless cases. For this

---

(1) Jour. Laryngol., Rhinol. and Otol., August, 1908.

reason we have given up the purely prophylactic indication for the radical operation and only operate when the dangerous character of the suppuration is recognized. The signs which point to this have been stated in detail, and when these are not present the necessary treatment can be carried out through the natural passages.

Middle-ear suppuration may be confined to the hypo-, meso- or epitympanic cavities, or may affect the mastoid antrum. Regular cleansing of the tympanic cavity by means of the tympanic cannula and syringe occupies the first place in treatment. It is of no great value to add an antiseptic to the water used for this purpose, but hydrogen peroxid is of great use on account of its mechanical cleansing properties. Boric acid powder must be applied with care when the perforation is a small one; that is to say, only under medical supervision. Nitrate of silver and alcohol give good results when the swelling of the mucous membrane is marked.

The removal of diseased or useless (dislocated) ossicles makes the complicated middle-ear space more simple and therefore more accessible to all therapeutic measures. It is of great importance that nasal and pharyngeal suppuration should be cured, since they often give rise to attacks of ear suppuration. It is also very important that in addition to local treatment the strength of the patient should be maintained, especially in the case of anemic children or those with enlarged glands. Salt baths or a stay at the seaside with or without sea baths often works wonders.

Radical Treatment. Scheibe,[1] after defining the expression "chronic middle-ear suppuration," states that he has come to the conclusion that Bezold's boric acid treatment and the methodical use of the antrum cannula *do* prevent the occurrence of mastoid and cerebral complications in cases of chronic suppurative otitis media. This conclusion is based on minute statistical inquiry to which he attributes great importance, though he knows that Professor Körner does not agree with him. The extensive personal experience of Bezold and Siebenman prove that he (Scheibe) is right. The generally accepted position of Wilde regarding the uncertainty of middle-ear suppuration

---

(1) Jour. Laryngol., Rhinol. and Otol., August, 1908.

has lost its validity. If, in spite of continued efficient direct injections and insufflations, the fetor of the discharge continues (this was in only 1½ per cent. of 750 cases of chronic middle-ear suppuration), the radical mastoid operation is advisable; the ossicles should not, however, be removed. Ossiculectomy through the meatus was not employed in a single case, because it is not free from danger and usually is unnecessary. By means of the statistics collected by Scheibe's pupil (v. Ruppert) we have for the first time a criterion by which other conservative methods of treatment can be judged.

In the discussion Thies (Leipsig) recommended the removal of the lateral attic wall in cases of chronic suppuration with affection of the attic and antrum which have resisted conservative treatment. The removal of the ossicles and tympanic membrane depended on the extension and position of the foci of disease. Cases with external symptoms of disease of the mastoid process are excluded. The operation is performed under local anesthesia according to Neuman's method. When the antrum shows signs of marked disease the adjacent part of the posterior bony meatal wall must be removed.

Treatment of Deafness Following Perforated Membrane. W. B. Chamberlain[1] has improved the hearing of patients with perforations of the membrane by adopting the following plan:

After making sure that no suppuration is present and after careful examination in regard to the shape, size and position of the perforation, the hearing is carefully tested with forks, acoumeter and voice, both conversational and whispered. The voice test if properly used is the most important, for it is the inability to distinguish conversation of which the patient complains the most bitterly, and there is often a strange disagreement between the distance for the voice as compared with that for musical sounds and noises. A sterile cotton plug slightly larger than the perforation is now formed by rolling a piece of absorbent cotton between the thumb and forefinger, and this plug is inserted by means of the ordinary bent forceps well into the perforation. Little or no pain should accompany the in-

---

(1) Cleveland Med. Jour., June, 1908.

sertion of the plug, nor should pain be present as it remains *in situ,* though a slight feeling of fulness is not unusual. The hearing is now again tested. Often the improvement is startling to the patient and to the physician as well. In a recent case of bilateral perforation it was more than 100 per cent., while in another case of unilateral perforation it was over 75 per cent.

The patient is now cautioned in regard to keeping the ear free from water and is ordered to report daily for examination. Any sign of pain or local inflammation is an immediate signal for the removal of the plug, as pain and irritation are premonitory of the beginning of a renewed attack of suppuration. Should this occur the ear must be treated in the usual way until all suppuration has ceased; after which the closure with cotton may again be attempted. If at the end of 7 to 10 days no signs of irritation are present, the hearing is again tested and the plug removed. A similar plug is now made and immersed in a warm sterile paraffin solution with a melting point of 105 to 110 degrees. Too much paraffin should not be allowed to adhere to the plug—a point which experience will soon satisfy. This paraffin-coated plug is now inserted into the perforation and the paraffin allowed to harden, thus hermetically sealing the opening. The hearing distance should be again tested and the patient kept under observation for 7 to 10 days, at the end of which time he may be discharged after being instructed to return at once in case of severe cold or any feeling of discomfort in the ear. Should it be found necessary to remove the plug, this may be easily accomplished by passing about its margins the warmed end of a probe, thereby melting the paraffin. After this it may be easily withdrawn by means of the bent forceps. Such plugs may remain in the ear 2 or 3 years without causing any discomfort.

The above method is not offered as a panacea for deafness; neither is it recommended, nor will it prove helpful, in all cases of perforation. In general it will prove most useful in cases in which one-fourth to one-third of the tympanic membrane still remains, in which the membrane is not bound down to the inner wall by firm adhesions and in which the perforation is situated in the posterior half. It may be tried in all cases in which we are dealing with a dry cavity. Care should be taken, however, in the promises of relief offered to patients; in the raising of false hopes often soon to be shattered.

Artificial Closure of Perforation of Membrane. William Hill[1] calls attention to the artificial closure of the perforation in marked temporary deafness during the subacute stage following tympanic suppuration. He uses a small tampon of cotton pressed down against the membrane in such a way as to close the perforation.

It is probable that in no condition is an artificial tympanic appliance likely to prove so successful in temporarily improving the hearing as in the subacute stage of tympanic suppuration, when all pain and acute inflammation of the tympanum have subsided—that is to say, usually in the second or third week following perforation. In this stage the deafness is usually still very marked, but there are often short, lucid intervals of fairly good hearing. Sometimes, as in the case of business men, it is important that for some special occasion the hearing shall be made as good as possible. When both ears are diseased, or where the hearing in the opposite ear has been destroyed, this procedure will be of marked temporary benefit.

THE MASTOID.

E. B. Dench[2] reports a number of cases and incidents to show the lack of constant *relation between diseases of the middle ear and mastoid disease and the differential blood count and bacteriologic findings.* While he does not question the value of such examinations, he cites cases in which the ear disease cleared up when the laboratory findings indicated severe conditions, and also cases in which operations upon the mastoid have revealed conditions out of all proportion to the laboratory findings. His suggestion is that when the laboratory findings correspond to the clinical symptoms they are confirmatory evidence, but when they disagree with the clinical symptoms the latter should be the guide in the management of the case.

---

(1) British Med. Jour., March 14, 1908.
(2) Laryngoscope, December, 1908.

Mastoiditis Following Operation for Chronic Otitis Media. E. B. Dench[1] reports the removal of a large mass of granulation tissue from the ear of a girl 14 years of age. The patient had had a chronic suppurative otitis since childhood. The following day the temperature suddenly rose to 106 degrees and the patient felt slightly chilly. A mastoid operation was performed and the sinus found to contain a firm clot. This was removed and the jugular vein ligated.

In the discussion following Dench's paper the opinion was repeatedly expressed that granulation tissue in the middle ear, associated with chronic suppuration, is a condition which demands serious consideration, and that in most cases the patient's interest is best served by an immediate mastoid operation.

Specific Gravity of Middle Ear Pus. P. Tetens Hald[2] has experimented with the specific gravity tests of the pus from the middle ear as an indication for the necessity of mastoid operation in acute otitis media. The technic which he uses is as follows:

"In estimating the specific gravity of the ear secretion we need a bottle (fitted with a dropper) for chloroform and another bottle for benzol. We must also have a cylindrical glass about 10 cm. high and 1½ cm. in diameter, an aerometer, and a flask for mixing chloroform and benzol. I use a mixture of 7 parts benzol and 5 parts chloroform. The specific gravity of the mixture is about 1.020. The secretion in the canal is sucked into a capillary tube. The cylindrical glass is filled two-thirds full with the mixture. A drop of pus is blown from the capillary tube into the mixture. The glass is stoppered with the finger and rotated once. If the drop of exudate sinks to the bottom chloroform is added drop by drop; if it floats benzol is added. In most cases we may add the chloroform quite rapidly at first. It sinks to the bottom and mixes with the fluid until the drop of exudate shows a tendency to move. We must then add the chloroform more carefully, until the exudate is held in suspension. If the exudate floats on the surface it is necessary to add a few drops of benzol, and

---

(1) Archives of Otol., June-August, 1908.
(1) Archives of Otol., October, 1908.

after each addition to close the cylinder with the finger and revolve it once, since benzol will otherwise remain at the surface. If now the drop of exudate stays at a certain level in the mixture the aerometer is quickly placed in the fluid and the specific gravity read. I do not first remove the drop of pus, for this consumes time. However, we should see that the pus does not adhere to the aerometer. The mixture is then filtered and preserved for future use in the flask containing the chloroform-benzol."

He finds three sources of error in this method of examination. 1. Error caused by the difference between the surface tensions of water and benzol-chloroform. 2. Error caused by the estimation being made in different temperatures. 3. Error caused by a portion of the benzol-chloroform penetrating the drop of pus.

He quotes Forselles' indications for operative interference as follows: "If in the course of an acute suppurative middle ear inflammation the specific gravity of the pus mounts above a certain level which is higher than normal, it denotes the presence of an empyema of the mastoid process, and is therefore an indication for operation." By empyema of the mastoid Forselles means pus under pressure. He believes that this increase in the specific gravity is due to the formation of granulation tissue is the mastoid cells, especially when drainage from the tympanum is not good. There are several factors to be considered which throw discredit on this theory.

In the first place it is highly improbable that diseased tissue in the mastoid cells invariably produces a secretion the composition of which (with respect to the relative number of pus cells) is so constant that the specific gravity always remains above a certain level.

In the second place we cannot be certain that the pus found in the external auditory canal originated in the mastoid cells and not in the tympanic cavity.

Third, the pus, while lying in the canal, may be altered by evaporation, by absorption of its fluid elements into the dressings, and by the condition of macerated epithelium from the canal wall.

The Heath Operation. *Conclusions.* Burton Haseltine(1) has sent to otologists a series of questions regarding their experience with the so-called Heath operation. From their replies and from his own experience he concludes:

---

(1) **Homeopathic Eye, Ear and Throat Jour., September, 1908.**

1. It is shorter and milder than the radical operation, involving less technical difficulty.
2. It endangers no important structures, such as the facial nerve and semicircular canals.
3. The period of healing is briefer, with no need of secondary measures, such as skin grafts.
4. It offers hope of greatly improved function, even better than can be expected from a nonsurgical cure.

If this be true, it means that we can offer these patients some things even better than a cure without operation, where that would require a long course of treatment. It removes, too, the last vestige of excuse for letting aural suppuration go uncured, and such a case becomes a reproach to someone's ignorance.

The Operation. The technic of the operation as recommended by Haseltine is as follows:

1. Administer a general anesthetic and prepare the patient as for a radical operation.
2. Make the same incision as for a radical operation, preserving the periosteum and exposing the same area of bone.
3. Detach the posterior soft canal freely down to the annulus to expose the middle ear, but with great care not to injure the drum-head or disturb the tympanic contents.
4. Open, explore and completely exenterate the mastoid antrum and cells and smooth the walls with the same thoroughness as in the radical operation.
5. Locate the aditus ad antrum and enlarge it as much as possible without disturbing the attic structures. This is an exceedingly important point not mentioned in the usual description. The walls of the aditus should be curetted away to the fullest extent, since upon the size and subsequent duration of this opening the entire success of the operation may depend. To do this without entering the attic is a matter of some delicacy. The use of adrenalin at this point will greatly help in obtaining a bloodless field.
6. With the Politzer bag and special cannula blasts

of air are forced through the enlarged aditus until all accumulated secretions and débris are blown through the perforated drum-head into the external canal. At this point the perforation may be enlarged by an incision if necessary. The cleasing is more thorough if sterile water is forced through and followed by air blasts. There is no objection to this, provided due gentleness is shown.

7. Protect the drum-head and aditus with delicate cotton pads and remove the posterior bony canal down to the annula tympanicus. The removal should be vertically wide, giving if possible a smooth floor to the combined cavity.

8. Prepare a flap, not by splitting the posterior half of the soft canal, but by freeing it intact from the anterior half by two long incisions in the top and bottom. Extend these incisions well out to the external meatus, so that the half tube thus liberated can slip backward without tension and line the posterior wall of the cavity. The healthy cellular and fibrous tissue of the posterior canal is not removed but left to assist in filling the mastoid space, leaving less of a pocket to impede drainage.

9. Insert sutures to close the external incision, including the periosteum. When ready to tie the sutures remove the cotton pads, clean away all débris and put a large ear speculum into the meatus. Under reflected light the posterior flap is now pressed backward and upward to line the mastoid space and firmly held in place by a strip of gauze inserted through the speculum. This must reach all the way to the tegmen antri, which can readily be seen. It must be pressed backward to obliterate all dead space between the flap and the bony wall. It is not necessary to put a drainage into the deep auditory canal, although this may be done if preferred. As this packing is inserted the sutures are tied by an assistant. This places the flap in a better position than can possibly be done by anchor sutures, which have a tendency to draw it away from the deepest part of the cavity, where it is most needed. The external dressing is the same as for a radical operation.

In the after care of these patients they are allowed to sit up as soon as nausea has subsided and food can be taken. At the end of 48 hours the inside packing is gently withdrawn, the Eustachian tube inflated by Politzerization and all secretions removed by gentle swabbing through the external meatus. The special cannula is then inserted into the aditus through the mastoid cavity and air blasts are sent through the tympanum.

The gauze is replaced, but only in the form of a light drain, without packing it as before. This dressing is repeated daily, the gauze drain being omitted after 3 or 4 days. The air douche is continued till the aditus closes by granulation, which will occur usually within a week or 10 days. The swab must be inserted all the way to the tegmen antri each day until the antrum becomes obliterated, as there is a tendency to closing off of a dead space above. While the air douche is no doubt sufficient in many cases, the author has no hesitation in using the attic syringe with suitable solutions where more thorough cleansing is needed, following it with air, preferably through a heater.

Relation of the Stapes to the Tympano-Mastoid Operation. A. H. Andrews[1] discusses the relation of the stapes to the tympano-mastoid operation. On account of the ease with which the stapes may be removed, or the annular ligament ruptured without removing the bone, certain precautions should be taken in that part of the tympano-mastoid operation which has to do with the removal of the malleus and incus and the removal of granulation tissue from the neighborhood of the stapes. The attachment of the tendon of the stapedius muscle to the back part of the stapes aids very materially in holding that bone in position when forward traction is made upon it. Hence in removing the incus, if the incudo-stapedial articulation is separated by pulling the incus forward from the stapes, injury to the latter is much less liable to occur. This can be accomplished by grasping the incus either by the short process or the body and giving the forceps a twist which will throw the long process forward before attempting to extract the ossicle. In work upon the cadaver the annular ligament has been ruptured experimentally by twisting the incus backward instead of forward before extracting it. While it is not easy to demonstrate on the patient that the annular ligament has been injured, the fact that hearing is more impaired, that bone conduction has been lessened

---

(1) Jour. Ophthalmol. and Oto-Laryngol., October, 1908.

after the operation, and that on the cadaver the annular ligament has been ruptured by procedures which are common in operations, it is reasonable to suppose that this accident has happened in operations more frequently than anyone has suspected.

During the healing process it is important to prevent the formation of granulation tissue which may cover the niche of the oval window or by adhesions displace or limit the movements of the stapes, and thus further impair the already deranged hearing.

It is not always easy to prevent the formation of excessive granulations in this neighborhood. As a general rule, however, it would seem that the less traumatism produced by the curette in the area immediately adjacent to the oval window, during the operation, the less tendency we will find to granulation tissue formation. When granulation tissue does form here it should be carefully removed, either by means of a curette or the ear polypus forceps.

With the parts under local anesthesia and with care on the part of the operator, the patient is not likely to permit any manipulation of the stapes which could injure the internal ear.

The desirability of retaining for the patient all the hearing possible, together with the increased danger to life when the labyrinth is exposed to infection, seems to the writer to make this subject worthy of most careful consideration.

Bezold's Abscess. W. S. Syme[1] gives the history of a man 52 years of age who had a Bezold's abscess opening into the pharynx. He had suffered from a right purulent otitis for 11 weeks. Three weeks before coming under observation the discharge ceased and a painful swelling appeared behind the ear and increased in size for 2 weeks, when suddenly he spat up a large quantity of pus, and pus also flowed from his nostrils. The swelling became smaller. Since then, however, it had again increased and on examination it was not difficult to diagnose a Bezold's mastoid empyema. On looking into the throat pus could be seen trickling down the right side of the pharynx, but a detailed view of the nasopharynx could not be obtained.

---

(1) Jour. Laryngol., Rhinol. and Otol., June, 1908.

Mentally the man was dull and lethargic. The walls of the meatus were so swollen that the condition of the membrane could not be determined. On operation the whole mastoid process was found to be excavated and the inner wall destroyed. The antrum was not in communication with the diseased part, and was therefore not opened into. The abscess in the soft parts extended deeply beneath the angle of the jaw, but no special effort was made to find a way into the pharynx for fear of getting subsequent trouble from a fistulous opening. The ultimate course of the case was in every way satisfactory.

Blood Clot Method Following Schwartze Operation. S. McCullough[1] reports three cases in which he used the blood clot method of dressing, following the Schwartze operation.

So few authors have reported cases treated by this method and the papers of those who have used it are so highly eulogistic that it is a cause of great wonder to him that a method that will shorten the convalescence from a mastoid operation 4 to even 20 weeks, and dispense with the necessity of dressings, should not have been more eagerly tried out thoroughly and given its true standing in aural surgery.

The factor militating most against a more extended trial is, undoubtedly, the knowledge that it is impossible to render the wound aseptic and that blood serum is a very good culture medium. We seem here to have ideal conditions for the propagation of bacteria—heat, moisture, a good medium, and bacteria. Every surgeon has seen so many wounds break down where the prospect for healing by first intention was so bright, and experience had taught him to expect it, that it is not to be wondered at that he looks askance at the proposition under consideration.

Before the mastoid operation it is well, in every case, to make a free incision in the drum membrane. This incision should include the mucous membrane on the internal wall of the tympanum. The ear is then irrigated thoroughly with a solution of bichlorid of mercury, followed by normal salt solution.

No antiseptics should be used at any stage of the op-

---

(1) N. Y. Med. Jour., June 13, 1908.

eration on the bone. If moist sponges are desired, they should be wrung out of normal salt solution.

A running subcutaneous suture is then introduced. This is started at the most convenient angle and the wound is laced to the other angle, the stitches not exceeding a half-inch in length. If larger stitches are taken the edges of the wound cannot be approximated accurately. The ends of the suture are left long. A piece of rubber tissue about an inch long, that has been folded 4 to 6 times to a breadth of one-eighth to one-fourth of an inch, is now placed between the last two stitches at the lower angle of the wound, so that it projects about half an inch into the wound cavity and the incision is closed by traction on the ends of the suture. The edges of the wound are coapted as accurately as possible and the ends of the suture knotted together loosely in such a manner that there is no strain on the wound. This is merely for convenience of removal. They can be cut off, provided a sufficient length is left for grasping at the time of removal. A second drain of rubber tissue is inserted in the canal and a dressing applied.

The drain that is inserted into the wound cavity is not placed at the bottom of the wound but very superficially under the line of suturing. Its object is merely to allow escape to the excess of serum expressed from the clot and it remains in place only 24 to 48 hours.

The author recommends this method as applicable to all cases of uncomplicated mastoid disease; brain and sinus complications, diabetes and certain recent and very acute cases forming the principal exceptions.

BRAIN AND SINUS.

EXTRADURAL ABSCESS.

C. P. Jones[1] reports a case of extradural abscess in a colored girl 20 years of age. Three weeks after the beginging of an otitis media the mastoid was operated upon. The whole process was found necrotic from antrum to tip with the external wall as thin as an eggshell, being penetrated with a gouge without the use of a mallet. The

---

(1) **Laryngoscope, July, 1908.**

cavity as well as the middle ear contained pus of the same general character, small pieces of bone, gritty in appearance, and débris. The ossicles were gone. Through the roof of the antrum there was a circular opening about three-eighths of an inch in diameter leading to an abscess in the middle fossa of the skull—an extradural abscess. Sufficient of the skull wall was removed to make a thorough exploration for the purpose of confirming the diagnosis. The abscess cavity was large enough to contain 2½ drams of pus. The cavity, as well as the whole wound, was irrigated with hot salt solution and packed with iodoform gauze in long strips.

The temperature for the next 12 days after the operation averaged 99¼ degrees F. per os, varying from normal to 100½ degrees F. per os. On the third day after the operation meningeal symptoms, as headache, restlessness and delirium, developed. The wound was then dressed and some more pus, about a dram, came from the abscess cavity. The same flushing and packing was employed as before. The next day there developed complete paralysis of the external rectus muscle of the right eye. The patient became wild at times, worse at night. The bromids, opium, chloral and hyoscin were tried to no avail. After 5 days of suffering, antipyrin, 10 grains, and soda, 15 grains, were given every 6 hours. The headache, delirium and restlessness disappeared as if by magic. Whenever there was the slightest headache, even after the patient was up and about, one of these powders would relieve it.

On June 6 the temperature suddenly rose to 103 degrees F. per os late in the afternoon. The next day, in dressing the wound, the patient for the first time complained of much pain on pulling the gauze from the abscess cavity, it being to all appearance clean. The cavity was not repacked. The temperature from this time on remained normal (reaching normal in about 24 hours), and healing was most rapid. She left the hospital on June 13. The paralysis of the external rectus muscle of the right eye did not wholly disappear till the latter part of July, 60 days after its appearance. As a tonic and alterative strychnin and syrup of the iodid of iron were given from one week after operation till the last symptom had disappeared. She is now perfectly well.

The case presents several points worthy of note:

1. The risk run by her obstinacy; she refusing operative treatment for so long a period while continually suffering with unmistakable symptoms of mastoiditis.

2. Paralysis being confined to one cranial nerve, the right sixth. According to Toldt's Anatomy, this nerve at a point in the middle fossa for a short space pierces the dura, and is protected by no other structure than its sheath. Thus any pus which gravitates here may set up a neuritis, causing paralysis from pressure of a swollen sheath, impairing the function of its fibers.

3. The good effects obtained by the use of antipyrin and soda in treating cerebral congestion when other drugs had failed. The author has since tried these drugs in conditions where a depletion of the cerebral capillaries is to be desired with most satisfactory results.

4 The irritating action of the packing in the abscess cavity after the discharge had ceased; as exhibited by a rise of temperature 13 days after the operation, and its prompt return to normal upon abandoning the packing. Likewise the rapid healing.

Meningitis Secondary to Chronic Otitis Media. P. D. Kerrison[1] reports a case of meningitis secondary to chronic otitis media. Four days after the beginning of the meningitis a radical mastoid operation was performed. History: On Monday, June 3, 1907, the patient developed severe left earache, so severe that he was directed to go to bed, and frequent hot irrigations of the ear were advised. On the following day, Tuesday, the earache was less severe, and toward evening was so far relieved that the patient, who is a lecturer in one of the universities, got out of bed and attempted to look over some examination papers. On the following morning the patient was obviously seriously ill. The chief symptoms at this time were fever, severe occipital headache and frequent vomiting. It was at 2 o'clock on this, the fourth day of the attack, that Kerrison was called in. The patient was vomiting; his face pale, cold and clammy, and drawn into an expression of pain. Rectal temperature, however, registered 103 degrees. Pulse, 120 and rather thready. Pupils somewhat contracted but re-

---

(1) Archives of Otol., April, 1908.

acted to light. Mental condition dull, in that questions put in an ordinary conversational tone were answered without understanding or not at all. But in asking a simple and direct question in rather loud and insistent tones he could be aroused and answered intelligently. Thus to the question where he felt pain he repeatedly and definitely located this in the back of his head.

Examination of the ears: Right ear, normal. Left ear, membrana tensa practically destroyed, tympanum containing granulations and a small amount of offensive pus.

Blood count: Dr. Sondeun showed a leucocyte count of 22,800 and a polymorpho-nucleophile count of 88 per cent.

Patient was removed the same afternoon to the Manhattan Eye, Ear, Nose and Throat Hospital. On admission at 4 p. m. the temperature had fallen to 101 degrees, rising 2 hours later to 102 degrees. Pulse, 126. Patient practically unconscious; it was no longer possible to communicate with him. Pupils very much contracted, so that Dr. Van Fleet found it impossible to examine the eyes until the local effect of belladonna had been obtained. No ocular changes were found present. Rigidity of the muscles of the back of the neck was now unmistakable. Other muscles not rigid. Reflexes not noticeably increased. Patient's condition now more nearly approached coma, in that, though restless, he was apparently oblivious to everything occurring about him. Dr. Whiting, in consultation, confirmed the diagnosis of cerebral meningitis and informed the patient's family that, in his opinion, the only chance of recovery lay in immediate operation. In this opinion Dr. Van Fleet and Dr. Bruce Phillips, his physician, concurred.

The question of lumbar puncture was discussed and was advised against on three grounds, viz.: (1) That the diagnosis seemed clear without it; (2) that the disease was of too recent development for probable changes in the spinal fluid; and (3) that the procedure constituted a possible additional strain upon the patient and seemed to offer no positive therapeutic advantage.

Operation: Usual postauricular incision. This latter was augmented by a second incision commencing near the upper end of the first and curving first upward and backward and then forward so as to form a flap, deflection of which exposed the outer wall of the midcranial fossa. Mastoid of sclerotic variety apparently eburnated throughout. Antrum deeply seated, small, and found to contain thick, creamy, ill-smelling pus. No perforations of tegmen antri demonstrable. Roof of antrum removed with chisel. Beginning from this point the squama covering the temporosphenoidal lobe was next removed over a space extending from before backward about 3 inches.

Appearance of dura: Removal of bone here, causing the dura to bulge considerably, showing decided increase in cerebral pressure. No pus was present between bone and dura, and no exudate was noticeable. Dura was congested, surface vessels being apparently engorged, and a few small areas of capillary injections being present. The dura was now opened by three parallel vertical incisions about 1 inch in length and 1 inch apart. Considerable oozing of cerebral fluid followed. A grooved director was now introduced into the lower end of the anterior incision and carried directly into the substance of the brain for about 2 inches. The director was then withdrawn and introduced successively through the lower ends of the middle and posterior incision. In the last situation the director was carried inward and somewhat backward to a depth of about 2¾ inches, and was followed by a considerable flow—not a gush—of cerebral fluid. The director was next introduced in exactly the same way through the upper ends of the 3 incisions, making 6 perforations of the brain in all. This completed the operation. No attempt was made to introduce a drain of any kind into the brain or into the dura openings. Loose sterile gauze was placed in contact with the exposed dura, this being covered by a large sterile absorbent dressing.

On the following morning the patient's condition was as follows: Temperature at 9 a.. m., 96.6 degrees. Pulse, 78. The dressing and part of the pillow case were saturated with cerebral fluid. The patient was exceedingly restless and complained of severe headache. The mental condition, however, was clear. Asked if he felt better than the night before, he replied promptly and positively that he did not; that the previous evening he had been "sitting up and examining student's papers," showing that his stay in the hospital previous to the operation represented a blank somewhat alarming. The temperature rose to 102.8 degrees. He complained of unbearable pain in the base of the head and along the spine, and his restlessness was such that the nurses had difficulty in keeping him in bed. This condition was controlled by morphin. The following morning found the patient more comfortable, and from this time there were no symptoms which seemed especially alarming. During the following 10 days there were regular evening rises of temperature, which then reacted and kept the normal line.

The progress of wound repair was watched with care as furnishing a possible indication of a final closing of the wound. At the end of the first week granulations were forming along the lines of the dural incisions and so covering the whole dural surface. The loss of cerebrospinal fluid, however, continued long after the dural incisions were hidden from view. While this persisted the wound was kept open by interposing pads of gauze between the dura and the under surface of the flap. The wound was finally apposed and sutured on July 15, about 6 weeks after the operation.

This case has been instructive chiefly in suggesting the following facts bearing upon the management of such cases: (1) That drainage of the subdural spaces may be obtained by simple dural incision and does not require the introduction of wicks or artificial drains of any kind. (2) That by the method followed in this case drainage of the lateral ventricles may be established without subjecting the brain or meninges to any injury likely to result in cerebral herniæ, or subsequent cerebral or meningeal infection. (3) That following such an operation the wound exposing the dura should not be allowed to close until the loss of cerebral fluid has practically ceased. Such delay not only insures against sudden increase of cerebral pressure but provides a barrier to cerebral infection by a protecting layer of firm granulations which has formed.

Acute Internal Hydrocephalus Secondary to Infected Labyrinth. S. R. Scott[1] reports a case of acute internal hydrocephalus secondary to streptococcus infection of the labyrinth. His reasons for reporting the case are:

---

(1) Archives of Otol., April, 1908.

1. On account of its comparative rarity.
2. Because it throws light on the early diagnosis of labyrinth infection.
3. For the reason that an operation on the labyrinth would probably have saved the patient's life had the true state of affairs been realized in time.
4. Inasmuch as it is possible to demonstrate postmortem the precise connection between the labyrinthine mischief and the attendant hydrocephalus.

The patient, a schoolboy, aged 14 years, had been under treatment for chronic purulent otitis media for several months. The tympanic cavity was full of granulations, which obscured all landmarks. A radical mastoid operation was performed; the lateral sinus was accidentally opened, but no evidence of internal ear involvement was manifest. The usual meato-conchal flap was turned upward and the cavity filled with absorbent gauze. Five days later he complained of headache and the vomiting ceased. By the eighth day the pain in the head had become severe and the temperature had reached 102 degrees. The original wound was reopened, but nothing could be found to account for the severe symptoms. The patient died the ninth day after the operation.

An autopsy was performed 20 hours after death. Examination of the left temporal bone showed that the eminence of the external semicircular canal was free from caries. The superior semicircular canal was vascular and looked like a deep red filament. The vestibule contained turbid fluid. The fenestra ovalis was occupied by granulations, which did not invade the cavity of the vestibule, although the foot-plate of the stapes had completely disappeared. In the larger coils of the cochlea the fluid was pale yellow and at the apex was blood stained. The surface of the cerebral hemispheres, vertical and basal, was singularly devoid of fluid in the arachnoid tissue of the sulci. The brain felt much firmer and more resistent to pressure than usual; this tenseness was evidently due to the accumulation of fluid within the ventricles, for when the horizontal section was made the fluid from the lateral ventricles escaped under high pressure, spurting out for a distance of 12 inches, and the brain regained its normal consistence. The fluid was not quite clear, but very slightly cloudy. The lateral ventricles were equally distended and held approximately 5 ounces. The third and the fourth ventricle had also evidently been distended, for they appeared abnormally dilated even after the fluid had escaped.

There was no occlusion of the Sylvian aqueduct and no abnormality of the veins of Galen or the foramen of Majendie.

The occurrence of acute internal hydrocephalus as a terminal lesion in meningitis is so common that an account of an isolated case would be devoid of interest. The feature of this case is the absence of meningitis.

With the knowledge revealed by the autopsy, a brief review of the symptoms and treatment may serve as an object-lesson.

The continuance of vomiting for several days after the radical mastoid operation for uncomplicated otitis media, and especially when followed by headache, will always suggest the possibility of labyrinthine infection.

In a patient capable of understanding what is required. the tuning fork and coordination tests should be carefully observed.

When we know that no opening exists in the external semicircular canal, we should deliberately explore the fenestra ovalis and fossula rotunda with the probe.

If labyrinthitis is present, nothing short of extirpation of the cochlea and vestibula can be considered as likely to give efficient drainage.

Had the labyrinth been opened in the present case and effectively drained, and at the same time the distended ventricles been relieved by lumbar puncture, or puncture of the brain, it is almost certain life would have been saved.

Intracranial Complications of Middle Ear Suppuration. S. J. Kopetzky[1] reports ten cases of intracranial complications of middle ear suppuration. Of the ten cases, there were four recoveries and six deaths. The fatal outcome was due in one case to septic pyemia, the operation coming too late to prevent the effects of the profound general sepsis. In a second patient, a child, death occurred presumably from shock, before the operative results could

---

(1) Annals of Otol., Rhinol. and Laryngol., March, 1908.

be determined. In the remaining fatal cases, the surgical intervention failed to arrest the progress of the disease.

The fatal outcome is not necessarily governed by the wide distribution of the pathologic process. Recovery followed in one case of the series notwithstanding there was extradural and intradural pus, with involvement of the lateral ventricle and spinal cord. A fatal ending was noted in those cases in which the posterior cranial fossa was the seat of the main foci of the lesion. The bone disease could be traced directly to the meninges by contiguity in only one of the fatal cases. The invasion of the posterior cranial fossa was shown beyond a doubt to take place by way of the labyrinthine channels, as illustrated by the gross operative findings in three cases. Moreover, this was borne out by the clinical picture. (Autopsies were not permitted.) It is the writer's impression that the outcome in some of these cases would have been a different one if the disease had been arrested in the labyrinth.

The meningitis and abscess formation in the cases terminating in recovery were caused by direct contact with diseased bone, without involvement of the labyrinth.

Judging from current experience with these lesions, it appears that meningeal inflammation by contiguity offers more favorable chances for a successful outcome after operation than does meningitis subsequent to invasion of the labyrinth. The middle cranial fossa is more tolerant of the purulency and responds more promptly to its surgical evacuation, than the posterior cranial fossa. Gatherings in the last-named location are not permanently relieved by surgical interference, without preliminary control of the purulent process in the labyrinth.

The treatment of these intracranial lesions is governed by the local findings in individual cases. Each patient will have to be treated according to individual requirements, and under these circumstances it is not possible to map out a general plan of treatment adapted to all cases. The management of these lesions is based upon the following principles:

1. The radical extirpation of the primary pathologic foci in the temporal bone, by means of a careful surgical exploration of the bony wound cavity (deep general anes-

thesia being usually required), for the uncovering and removing of neglected purulent mastoid cells; with examination of the exposed sinus wall and the tegmental dura. A wider opening of the middle ear spaces is indicated in cases with a suggestion of labyrinthine involvement; here the wall of the labyrinth capsule must be explored for evidence of the route of invasion of the internal ear. After the infection of the labyrinth has been demonstrated, a further exploration of the internal ear is required in the presence of defects in the walls of the semicircular canals, or ulcerations of the labyrinthine windows, or perforations in the cochlear convolutions. The internal ear is to be explored upon the basis of positive findings only, since this interference represents a very grave surgical procedure, which, moreover, implies the destruction of hearing in the affected ear.

2. The evacuation of extradural, intradural and brain abscesses, with establishment of meningeal drainage. The condition of the exposed sinus wall is revealed by its appearance, coloration, touch, etc. A perisinus abscess is emptied by the mere exposure of the sinus wall. The uncovering of a small area of dura over the tegmen is harmless in itself, provided the dura is healthy. Its systematic performance in doubtful cases will frequently serve to reveal the presence of unsuspected extradural gatherings of pus. Intradural lesions may be suspected upon the evidence of the exposed dura (aspect, color, feel) in combination with existing intracranial tension This suspicion is confirmed when the dura is found to be covered with discolored granulations, pus escaping between the meshes.

Large areas of necrosis in the dura are removed, while small necrotic spots are allowed to remain. An incision of the dura provides for the escape of intradural pus Large collections are best managed by means of exposure through the squamosal plate, and application of a counter-opening, for the facilitation of meningeal drainage. Multiple parallel incisions in the dura have been found serviceable. The evacuation of an abscess in the sphenoidal lobe, or puncture of the lateral ventricle, if required, is easier of performance from the opening in the squamosal plate than by way of the existing wound.

Exploration of the sinus and eventual ligature of the internal jugular vein may become necessary by the development of sinus thrombosis as a sequel to the evacuation of a perisinus abscess. Under these conditions, surgical interference is indicated at once after the diagnosis has been rendered. A cerebellar gathering of pus is suggested by a continual high temperature with a healthy wound, after ligature of the internal jugular vein, and evacuation of the clot, in sinus thrombosis. This indicates the removal of the inner mastoid table overlying the cerebellar meninges. After the cerebellar abscess has been located, the pus may be reached either by way of the mastoid wound or through the cortex, posteriorly, the procedure to be adopted depending upon the location of the abscess in a given case.

3. The maintenance of normal intracranial pressure as far as feasible, through repeated lumbar punctures. The diminution of intracranial pressure, through the withdrawal of cerebrospinal fluid, is of importance, apart from any diagnostic data this may furnish. Relief and amelioration were invariably shown, in the writer's experience, after lumbar puncture, by a clearing of the consciousness, a diminished rigidity of the back, and, as a rule, an improvement of the patient's general condition. The progressively diminishing purulency of the puncture fluids obtained from the favorable cases, at different dates, is of auspicious augury and stimulates further efforts in the interests of the patient. Meanwhile such an outcome is reserved for the cases with a patent foramen of Majendie. The prognosis is a gloomy one when this outlet is obstructed, with a negative pressure of fluid in the spinal canal, and high tension of fluid in the subarachnoid space intracranially.

Drainage of Brain Abscesses. F. Whiting[1] calls attention to the necessity of adequate drainage as an essential step in the successful surgery of brain abscess. His attention was called to this fact because of the observation that case after case of acute brain abscess would die after appearing to be doing very well for several days succeeding an operation which had relieved the patient, temporarily at

---

(1) Medical Record, Jan. 23, 1909.

least, of the most urgent and threatening symptoms. After a few dressings there would gradually appear the characteristic manifestations of acute purulent encephalitis, which thereafter progressed rapidly until meningitis or ependymitis supervened and death ensued. He was accustomed at first to consider that infection had spread from the abscess cavity by means of veins or lymphatics which had undergone erosion as the result of unavoidable extension of the purulent process into contiguous tissue, and did not then appreciate that faulty technic was to any great extent responsible for the mishap.

The findings of two autopsies, however, furnished valuable food for reflection, for in each instance when the brain was cut and the abscess exposed there appeared discolored and softened areas of brain tissue radiating from the abscess wall and the drainage channel at varying angles and extending to various depths, with infected areas corresponding to fistulous paths and sinuses which had been made in the course of dressings in attempts to introduce gauze into the abscess cavity along a canal which could not be inspected. These infected tracts had been made after the same manner as false passages are produced in the urethra by misdirected sounds, after seeing which he realized for the first time how probable it was that faulty technic had contributed to a considerable extent to the unexpected fatalities in those cases which had appeared so promising immediately after operation.

An acute brain abscess has a limiting wall of fibrin of such delicate texture and scanty resistance as to offer, after evacuation of the abscess contents, little or no opposition to the tendency of the brain with its soft, pulpy consistence to collapse the walls of the abscess and prolapse toward the opening made in the dura at the time of operation, under which circumstances any attempt to introduce gauze drainage by the usual method is attended with serious risk of making a false passage with the probe and gauze, thereby conveying infective material into hitherto entirely healthy brain structure. That such an experience is most likely to result, observations upon the autopsied brain have satisfactorily demonstrated. It is a very simple matter to introduce gauze through a small opening, beyond which one cannot see, into a cavity with rigid walls in such a manner as to entirely fill the space and so dispose the gauze as to maintain uniform pressure upon all sides; but it is an entirely different proposition to carry gauze to the bottom of a deep cavity the opening of which is small and the channel leading down to which is narrow, with delicate walls which will be wounded or lacerated at any point where the probe carrying the gauze deviates in the least from the direction of the passage for discharge from the abscess cavity.

With the hope of reducing and if possible eliminating from the postoperative treatment of brain abscess this dangerous and unnecessary traumatism, he several years ago devised an instrument which was called an encephaloscope. This appliance was designed to permit, with the aid of artificial illumination, the critical inspection of the brain abscess cavity in such a manner as to avoid all violence to the brain tissue. Moreover, by the employment of this instrument the introduction and proper adjustment of gauze or other drains in the depths of the wound, both at the time of operation and during subsequent dressings, became an exceedingly simple and altogether safe procedure.

The first essential step in abscess drainage is to secure complete evacuation of all purulent contents. That this may be properly accomplished, all obstructive bands of fibrin and necrotic tissue must be removed, and any communicating collections of pus made tributary to the drainage channel, since failure to remove such focci is responsible for the formation of the so-called multiple abscesses which are later discovered, and from the disastrous consequences of which the patients sometimes escape, when they are so situated as to admit of successful counter-drainage, but to the effects of which they more often succumb.

With the aid of the encephaloscope the cavity of an acute brain abscess can be quickly cleared of all gross or macroscopic infective material, but with the chronic abscess it is necessary to leave *in* situ the thickened capsule to slowly undergo sloughing, absorption and organization. The temptation to use the curette upon the sloughing walls of a chronic brain abscess is almost irresistible, particularly since the encephaloscope affords so excellent a view of every part of them and the procedure, could it be performed with sufficient thoroughness, would undoubtedly materially reduce the difficulties and duration of treatment. There seems to be no positive contraindication to such a step, if undertaken with great care and delicacy and with satisfactory illumination, except when the bottom of the abscess sac lies in close proximity to the ventricles, under which circumstances any attempt at curetting would be hazardous in the extreme. In judiciously selected cases, however, when the abscess is favorably situated—not too deep—it seems to him that curetting of chronic brain abscess where the lining membrane is very thick has little to condemn and much to commend it. In any event, when large tufts of necrotic granulations are seen upon the abscess wall they should be scraped away lest by remaining they be permitted to conceal a path of infection already extending into adjacent brain tissue.

Three important details are especially emphasized:

1. Scrupulous care to be exercised in inducing complete evacuation of all pus and pyogenic material at the time of operation.

2. The establishment and maintenance of uninterrupted communication by means of gauze or other drains between the deeper portion of the abscess cavity and the drainage opening, without adding unduly to the pressure upon the brain substance surrounding the walls of the abscess.

3. The avoidance not only at the time of operation, but especially during the after treatment of gratuitous infection of healthy surrounding brain tissue by misdirected efforts at the introduction of gauze or other drainage material attempted without the assistance of actual inspection of the abscess path.

With a proper appreciation of the importance of these essentials, and a rigid attention to the details necessary for their correct performance, I am well convinced that we shall save many lives which, notwithstanding the promise of a brilliant operation, were formerly lost; a mortifying sacrifice to the avoidable errors of after treatment.

Diagnosis of Postoperative Involvement of Lateral Sinus. J. F. McKernon[1] gives the following points in the diagnosis of postoperative involvement of the lateral sinus: In typical cases it is based on the temperature changes, with the chill or chilly sensation preceding the rise in temperature following the mastoid operation. In cases in which the sinus is operated on at the time the mastoid operation is done, and there are no previous symptoms as a guide, the diagnosis is based largely on physical signs; the dura is lusterless, thicker than usual, and of a grayish or yellowish color, with frequently an adherent plastic exudate. The dura itself looks flat, does not present an oval appearance, is easily compressible, and does not fill quickly when pressure is removed. The mère presence of an epidural and a perisinus abscess is by no means an indication for exploring this channel, and the same is true if the sinus wall is covered with granulations, for this is nature's effort to protect the structures beneath. Bacteriologic examinations of the discharge from the ear are of value, as certain forms of infection are prone to greater activity and involve adjacent blood currents more rapidly than others. A further aid in diagnosis is the differential blood count, of which the important part is the polynuclear percentage, which, if it be 80 or over, is indicative of pus-absorption, while the leucocyte count merely gives information as to the patient's resistance to the disease. A still further aid can be obtained from the blood by cultures; the knowledge thus gained is very valuable, and at the same time positive evidence can be gained of the nature of the blood constituents. These blood cultures will supplant in real value all other forms of examination as an aid in diagnosis.

---

[1] Jour. Am. Med. Assoc., Jan. 9, 1909.

In atypical cases the diagnosis is also made from the temperature changes, the patient's condition, and the physical signs present. These cases develop several days after the mastoid has been operated on, and can best be described by briefly outlining a case during its development and course. Take a postoperative case following its usual course for several days, when anywhere from the fourth to the tenth day the patient is restless, his appetite poor, his tongue slightly coated, his pulse 90 to 100, his temperature 99.6 to 100.6 F. The next day the temperature is from one to two degrees higher, with no marked remissions; restlessness is more pronounced; the patient is irritable, and has anorexia; his tongue is dry at the edges, and the coating more pronounced than on the previous day; the pulse is 110 to 120 per minute; the patient has general headache, and nausea, and is unable to sleep quietly. The day following the temperature is 104 or higher, and the pulse 120 or 140 per minute, showing less tension. The headache is more pronounced, and the restlessness, irritability and sleeplessness are distinct symptoms. The tongue becomes brown and dry and has a glazed center. If allowed to progress for another day, the temperature is 105 F. or higher, pulse 140 to 150 per minute, and weaker. The patient is drowsy and apathetic; as the infection progresses the temperature is practically stationary. The pulse becomes weaker and the evidences of a general pyemia are present. A physical sign which is of distinct value from a diagnostic standpoint is the condition of the inner table covering the thrombotic area. Instead of being white and of a normal color, as when the mastoid was operated on, it will be found dark. This is a distinct evidence of disease beneath, the change in color being due to an obstructed venous circulation throughout the bone at this point. If the sinus was exposed at the time of the primary operation, the dura covering it will be found to have undergone a marked pathologic change. It now presents a grayish or yellowish appearance, is flat and covered with fibrinous exudate.

Thrombosis of Lateral Sinus, with Recovery. Friedenwald[1] reports five cases of thrombosis of the lateral sinus with recovery. He believes:

1. That the favorable prognosis of cases of thrombosis of the lateral sinus depends upon the surgical removal of the infected thrombus at the earliest possible moment, before metastatic infection has occurred, or upon the effective limitation of the infected mass by a solid non-infected thrombus at both ends.
2. That the early diagnosis may and should be made in those cases in which chills, sweats and pain are absent on the characteristic sharp rises of temperature to 104 degrees and higher, and the irregular fever, when other

---

(1) Laryngoscope, January, 1909.

conditions which may cause high temperature can be excluded.

Curettement of Lateral Sinus. F. Voss[1] condemns the practice of curetting the lateral sinus in cases of thrombosis. His rule is, in every case where sinus thrombosis is suspected, to immediately expose the sinus and aspirate. If the presence of a thrombus is verified, the jugular is then ligated and divided. He then exposes the sinus freely, going well beyond the limits of the thrombus; but the jugular bulb must not be opened, for fear of disturbing the obstruction, which is often very firm. The sinus is incised over the entire length of the thrombus. The incision not only extends to the end of the clot, but slightly beyond. The entire outer wall of the sinus is cut away with scissors so that the thrombus throughout its entire extent is freely exposed. The thrombus is allowed to remain *in situ.* Free drainage of the infectious material is now assured, and the thrombus can be left to its fate. After inserting the gauze in many cases he sutures, in part, the skin wound over it, taking care to leave apertures through which the packing can be removed.

The author thinks that the continuance of fever of the pyemic type following operation is not due to the presence of thrombus centrally situated, but rather to insufficiently free drainage of septic products.

INTERNAL EAR.

OTOSCLEROSIS.

A. R. Tweddie[2] discusses the etiology, diagnosis and treatment of otosclerosis. Its pathology has been fairly well established, and its history and course are comparatively well known, but its cause is still obscure. It must further be admitted that its diagnosis, especially in the initial stages, may at times be most difficult, while as regards its treatment we do not yet know any method or drug which can be claimed as curative.

The chief pathologic changes may be described as con-

---

(1) Archives of Otol., June-August, 1908.
(2) The Lancet, Dec. 19, 1908.

sisting of the formation of small, well-defined areas of newly formed bony tissue which replace the true bone. These occur probably as the sequel of a local trophic disturbance or vascular stasis, and consist in the rarefaction of the parts so affected, which subsequently become sclerosed and, in places, proliferated. Between these pathologic changes and the healthy adjacent bone, a sharp line of demarcation exists. The commonest site for these alterations is the anterior superior angle of the oval window, and their chief result is ankylosis of the stapedio-vestibular joint.

Bearing in mind the pathologic changes, it is obvious we are dealing with a condition which is necessarily most unresponsive to drugs or any other method of treatment. It may be improved, however, or perhaps it would be more accurate to say may be arrested, by the exhibition of drugs and by general treatment when circumstances permit an ideal life in healthy surroundings, especially if at the same time care and worry can be reduced to a minimum and the least possible demand made on both mental and bodily energies.

The disease seems to be attributable either to circumstances which affect the general nervous system, or to alterations of the normal condition of the blood and circulatory mechanism. Thus its commencement can be constantly referred to shock, fright, sudden grief or prolonged mental anxiety, whilst as instances of the second group of causes, chlorosis, anemia, severe hemorrhage and parturition may be mentioned, and its incidence is traceable at times to the establishment of the menstrual functions in young girls. General febrile conditions also have a causative relation to its onset, influenza being especially noticeable in this respect; and finally it appears to be much more common in people of the neurotic type.

The objective examination of the ear is chiefly "negative," that is to say, the tympanic membrane is found normal or nearly normal, though it sometimes presents a peculiar pinkish, hazy appearance, often quite characteristic, though difficult to describe accurately. The membrane is movable together with the handle and short process of the malleus, and there are no signs of inflammatory or catarrhal conditions either past or present.

The functional test, as a rule, affords very similar results to those found in any other lesions which involve the conductive apparatus of the middle ear, and may be briefly enumerated as consisting of marked depreciation of the range of perception for whispers, little or no lowering of the upper tone limit, definite raising of the lower tone limit by air conduction, perception via the bone greater than via the air, bone conduction greater than that of a normal observer. Another symptom common to this and some forms of middle-ear disease should here be mentioned, viz., the well-known phenomenon of hearing better in a noise, the theories as to the cause of which do not here concern us. Such results (other pathologic conditions of the conducting apparatus being excluded) point to the more or less impaired mobility of the footplate of the stapes in the oval window in the immediate vicinity of which, as already stated, is the most common site for the disease.

Many cases, however, are found which do not conform to these results, the cause for which is probably dependent on the coexistence of other foci of the disease in the bony capsule of the labyrinth.

As regards the diagnosis, we have three main classes to consider: The uncomplicated cases, those associated with other diseases of the middle ear and Eustachian tube, and those which have to be differentiated from other lesions of the auditory nerve itself. In early, uncomplicated cases we have little else to depend on for diagnosis but the results of accurate functional tests and the absence of obstructive or catarrhal lesions in the tubes and middle ear. Should, in addition, the membrane present a pinkish haze, this is almost pathognomonic of the disease. In cases associated with catarrhal and post-inflammatory conditions in these situations, the very slight improvement or even deterioration of the hearing after their treatment is very strongly suggestive of otosclerosis. When the disease involves portions of the bony capsule other than the margins of the oval window and the mobility of the stapedio-vestibular joint is unimpaired, it is impossible at once to distinguish the symptoms to which it gives rise, from those due to other diseases of the internal ear. The subsequent involvement of the conductive apparatus will, however, help to establish the diagnosis. In well-established uncomplicated cases of otosclerosis the diagnosis is generally not very difficult.

Some observers have made use of a large series of tuning-forks in working out the functional tests, in order to locate the site and to estimate the distribution of the disease in the bony capsule of the labyrinth. However, except perhaps from an academic point of view, such extensive data effect no object, whilst sufficiently accurate knowledge can be obtained with the use of three tuning-forks—"C-4," "C-64" and "E"—together with testing the hearing with a standard watch, an acoumeter, or Galton's whistle. Mention ought also to be made of Gelle's test, the response to which, if positive, is very strong evidence against the presence of otosclerosis—at any rate, in its most usual situation—because it points to mobility of the stapedio-vestibular joint and the functional integrity of the same.

It is inconceivable, in the present state of our knowledge, that any local treatment can effect a cure or even permanent improvement in a disease of this nature, and such, indeed, is the conclusion to which one is driven after a careful review of the work done and of the efforts made in this direction. Many ingenious operations have been suggested and carried out, but, although isolated instances are reported where temporary improvement has occurred, relapse and, eventually, further deterioration seem to be the usual result. Most operators freely admit the inefficiency and inadvisability of such attempts at operative interference. Removal of the stapes would at first sight seem reasonable as a possible means of removing the cause of obstruction in the region of the oval window, and with this end in view that operation has been performed. Small trephine openings have also been made into the vestibule through the inner wall of the tympanum with the object of allowing an unimpeded transmission of sound-waves to the termination of the auditory nerve. Neither of these procedures, however, has been followed by any appreciable success, but indeed more often they have led to increased deafness. This is not surprising when we reflect that the resulting cicatrices must, if anything, constitute a lesion more obstructive to the passage of sound-waves than the preexisting bony barrier. Finally, various attempts have been made toward the remobilization of the stapedio-vestibular joint, but they have served only to stimulate a firmer ankylosis of that articulation. Injections of fluids and vapors via the Eustachian tube have been practiced, but, as such a statement indicates, with no beneficial effects. Rapidly recurring variations of air pressure in the external auditory meatus, by which some claim to have obtained improvement, have for their object a remobilization of the joints of the ossicular chain, and in particular of the stapedio-vestibular joint.

Theoretically, it seems most improbable that any such oto-massage can influence the process of disease in the latter situation even in its earlier stages, and when ankylosis has occurred, a beneficial effect from this procedure seems inconceivable.

Attempts at local treatment are therefore strictly contraindicated, and in uncomplicated cases all manipulative or operative procedures in the nose and nasopharynx should be studiously avoided.

These patients should be advised to put themselves under the care of their usual medical attendant for a course of treatment extending over several months, with the object of so improving their general condition that a further unfavorable progress may be prevented. Such treatment should consist in a very strict adherence to the general rules of health, coupled with the exhibition of such medical aids as will conduce to the maintenance of all the functions of the body in the best possible state. The efficient and healthy action of the alimentary tract and digestive apparatus must be insured, and any other concurrent maladies, such as anemia and its results, should be treated, and special attention should also be paid to sufficient exercise, fresh air, judicious clothing, and diet, whilst that climate or locality which best suits the patient's general health should be strongly advised. Avoidance of worry and overwork, in so far as it may be possible, should be also enjoined, as they doubtless act unfavorably on the course of the disease.

Apart from the drugs necessary to combat any general dyscrasia from which the patient may be suffering, tonics, such as strychnin, phosphorus or arsenic, alone or combined with the iodids, should be advised. This treatment in the first instance should be adopted for a period of some six months, with short remissions, and then short courses of these medicines extending over six weeks should be advised two or three times a year. In this way the further progress of the disease may be controlled to some extent, though, of course, a cure of already existing lesions cannot be expected. Such treatment, however, often makes the patient more comfortable generally, reduces the tinnitus, and apparently improves the hearing. The improvement is usually more apparent than real, and is due probably to the relief of the subjective noises, for the results with the functional test remain much the same.

Deafness Following Mumps. G. W. Boot[1] reports a case of deafness following mumps and analyzes the 51 cases already found in otologic literature.

The pathologic anatomy of this complication has not yet been fully worked out. Reasoning by analogy from postmortem findings in labyrinthine disease from other causes, it seems certain that this complication is not due to pyogenic organisms. It is not due to an extension of a middle-ear inflammation. Thrombosis of a branch of the internal auditory artery, hemorrhage into the labyrinth, and acute neuritis of the auditory nerve may be present; but, judging from the absence of similar conditions in other parts of the body in mumps, they do not seem likely causes of the labyrinthine affection. It seems likely that the trouble is an acute infection by some nonpyogenic microorganism, probably the streptococcus described by Bein, Michaelis and Busquet as the cause of mumps, and that it reaches the labyrinth by way of the blood, causing an inflammation that may reach any grade short of pus formation. In some of the cases in which hearing improved considerably under treatment, the inflammation could hardly have been more than a serous effusion into the labyrinth. In most of the cases it must have reached a grade severe enough to have caused destruction of the delicate structures of the organ of Corti and of the sensory mechanism of the semicircular canals and vestibule. This type of inflammation is in accord with that seen in the

---

(1) Jour. Am. Med. Assoc., Dec. 5, 1908.

parotid, where there is serous effusion with some cellular infiltration.

The following may be considered as descriptive of the symptoms of a typical case of this complication. About the seventh day of an attack of mumps, but possibly as early as the first day or as late as the fifteenth, the patient, who has no other signs of ear involvement, is seized suddenly with severe vertigo, nausea and vomiting, headaches of a mild type, and loud subjective noises. He is unable to walk except in a staggering or drunken manner. In the course of twenty-four hours he becomes quite deaf to the spoken voice in the affected ear. Air conduction is much diminished or lost in the affected ear. The Weber test is lateralized in the better hearing ear if the disease is unilateral. The Rinne test is positive if both ears are involved; negative in the affected ear if but one ear is involved. Bone conduction is of normal duration if but one ear is involved, much shortened if both are affected.

The prognosis is bad. A few patients show some improvement in hearing under appropriate treatment used early. Most patients have had no subsequent improvement in hearing under any form of treatment. The vertigo often disappears, but in some cases persists in a lesser degree for years. The subjective noises tend to become less troublesome in the course of time.

Treatment should be both preventive and curative. Preventive treatment should consist in avoiding the things that tend to cause metastasis, particularly chilling of the body. Excitement, both general and local, should be avoided. Elimination should be promoted. Intoxication by food, drink or intestinal putrefaction should be avoided. Circulatory sedatives should be administered.

Curative treatment should be directed toward the absorption of the inflammatory products in the labyrinth before they have caused permanent damage to the intralabyrinthine structures. Potassium iodid and pilocarpin are the two remedies that have been most efficient. Sudorifics, diuretics, cathartics and cardiac depressants would seem to be indicated to limit the amount of effusion into the labyrinth and to cause its absorption. Local depletion might help if used early, but its effects are problematic. Inflation, aural massage and remedies that cause aural congestion are contraindicated during the early stages of the attack.

G. W. Boot[1] reports a case of *suppurative bilateral middle ear disease with labyrinthine involvement limited to the cochlear portion of one side and to the vestibular portion of the other side.*

The diagnosis was based upon the following:

The patient is very deaf and conversation can only be carried on by means of a speaking tube, or, as she habitually does with her mother by laying her cheek against her mother's while the latter is talking. Tuning fork tests. —Bone conduction, using the big A fork in the median line, is prolonged about 30 seconds. Bone conduction is about 20 seconds longer over the left mastoid than over the right. Weber is lateralized in the left, the better hearing ear. Rinne is negative in each ear. The right ear is apparently deaf to all sounds. The left ear has for its low limit the tuning fork of 100 vibrations. Below this point her answers are so uncertain that it is evident that she does not hear the tones. From 100 vibrations to G^2 she hears by air conduction, then follows an area of deafness until 15 of the Edelmann-Galton whistle is reached, when shows an island of hearing reaching from 15 to 11 of the whistle. Above 11 she hears nothing.

There is a little spontaneous nystagmus on looking toward the right, but none on looking toward the left. Cold in the left ear caused no change. Heat in the left ear caused no change. Cold in the right ear caused marked dizziness at once, so severe that the patient found it necessary to cling to the table for support. On looking toward the right she showed a marked nystagmus. On looking toward the left there was a slight amount of nystagmus developed. After using heat in the right ear there was a slight degree of nystagmus developed on looking toward the right, but none at all on looking toward the left.

There was no change on using Siegel's speculum in the left ear, but either compression or rarefaction of the air in the right tympanum caused dizziness. The use of

---

(1) The Laryn., March, 1909.

Siegel's speculum had no effect on causing or inhibiting nystagmus.

Neither nystagmus nor dizziness could be elicited by the use of the probe in the right ear. She walks forward or backward with the eyes either open or closed, and shows no disturbance of equilibrium or gait. She draws lines with the eyes closed, simultaneously, of slightly different length, the right being 1-10 shorter than the left. These tests would seem to indicate that the right vestibular apparatus is intact and in an easily irritable condition, *i. e.*, that it can respond easily to caloric tests. The left vestibular apparatus, on the other hand, responds so slightly to the caloric tests that he concludes that its function has been largely interfered with if not entirely destroyed. The slight spontaneous nystagmus is probably due to a hypersensitive or an unbalanced right vestibular apparatus.

There are three chief avenues by which infection can extend from the middle ear into the labyrinth. They are, the fenestra rotunda, the fenestra ovalis, and direct extension through the bony wall of either the lateral semicircular canal or the promontory. Of these the two former would seem to be the more likely routes in this case, for the fenestra rotunda is closed by a delicate membrane only, and the fenestra ovalis by the footplate of the stapes and its annular ligment. These structures would appear to offer less resistance to infection than the layer of dense bone surrounding the labyrinth.

Some of the questions that arise in connection with labyrinthine involvement in the course of suppurative middle ear disease and are yet to be settled are these:

1. When the labyrinth becomes involved during the course of a middle ear suppuration, is this involvement always due to an invasion of pus, or can there occur an inflammatory exudate temporarily or permanently disturbing the function of the labyrinth without any actual pus formation?

2. How much destruction can be expected to follow a nonpurulent exudate into the labyrinth?

3. Does a purulent exudate into the labyrinth necessarily destroy the function of all the end organs in the labyrinth?

Localization of Otitic Brain Abscesses. Drs. Sachs and Berg[1] discussed the common and uncommon localizations of otitic brain abscesses. The difficulties in locating brain abscesses by the peripheral symptoms are sometimes insurmountable. In other cases the abscess can be accurately located and the correctness of the diagnosis confirmed by operation.

In the case of a woman, aged 42, who had suffered from left chronic oforrhea for many years, brain symptoms developed with headache, nausea and vomiting. She had no dizziness, chills or fever. After two or three weeks she became unable to speak the names of people in her home. The difficulty of speech increased and she failed to answer questions addressed to her. This was not due to any inability to utter words, for she spoke freely enough, but was due to the fact that she entirely failed to grasp the meaning of questions addressed to her. There was a condition of semistupor with slight rigidity of the neck, a slight degree of facial paralysis, with some weakness of the right upper and lower extremities with increased reflexes in the right arm and leg. Her pupils were equal and reacted to light. There was no paralysis of the ocular muscles, but there was a slight optic neuritis. Further examination showed distinct inability to comprehend speech. Spontaneous speech was correct, though she occasionally used words which she did not intend to use, but she failed absolutely to respond to such ordinary requests as to close her eyes, to grasp the hand, to flex the fingers, to frown, etc., thus showing that she did not understand questions addressed to her.

A mastoid operation was performed and the dura in the middle fossa was exposed. There was no visible pulsation, but the dura bulged considerably.

About one inch beneath the cortex two drams of seropurulent fluid were aspirated, and this was followed by a thick, creamy pus. The needle was left *in situ,* the dura was incised for about one-half inch alongside of the needle, a curved director was passed along the needle into the abscess cavity, and then the opening was enlarged with a dressing forceps. About two ounces of thick, creamy pus

---

(1) Medical Record, Jan. 23, 1909.

was evacuated. Drainage was established at the most dependent point by a soft rubber tube and narrow strips of plain gauze. Closure of the soft parts was affected down to the emergence of the drain. A dry aseptic dressing was applied.

The patient was not at all shocked by the operation, during which there had been very little hemorrhage. The next morning the patient's sensorium was much clearer. She was able to talk and recognized familiar objects, though unable as yet to name them. In the afternoon she was able to name some things, such as glass, spoon and the parts of her body. Rapid recovery took place and, contrary to expectations, the aphasia entirely disappeared within 48 hours; likewise the weakness of the extremities and the right facial paralysis. The drainage tube was removed 10 days later. The abscess cavity rapidly contracted and the patient was discharged cured after 3 weeks.

The patient was seen repeatedly after this and was always found to be in perfect health. There is no ear discharge; the defect in the squama of the temporal bone has been almost entirely filled in by new bone. There is no hernia cerebri.

From a neurological point of view the points of special interest in this case are these: On account of the slight involvement of fibers coming down from the motor area the subcortical location of the abscess was correctly surmised. The rapid recovery from the speech defect and the disappearance of the motor paralytic symptoms in the extremities were astonishing. This cannot be interpreted in any other way than that in a slowly growing abscess, as this one surely was, the cortical centers and the fibers leading from them to deeper parts may be either only indirectly affected, or may be dislodged rather than destroyed, and with the evacuation of the pus the dislodged parts resume their normal function. Even if one were willing to suppose that the right half of the brain had assumed some of the speech functions in the case of an abscess which must have lasted for some weeks or months, the paralytic symptoms in the right half of the body were surely due to involvement of fibers descending from the left motor area, and these must have been either compressed or slightly dislodged without having been at all destroyed, or else they could not have regained so quickly their normal function. In this instance the sensory aphasia and the paraphasia were important symptoms pointing directly to the involvement of the left temporosphenoidal lobe.

When the surgeon is asked to deal with an abscess of the brain that is as accurately localized as was the case in our two patients, his concern is entirely with the technical parts of the operation. He does not have to consider those technical details that must always receive attention when we open the skull for exploratory purposes. His concern is to approach the abscess by the most direct route, evacuate the pus, and establish satisfactory drainage of the cavity. It is evident that in any case there are three main considerations:

1. A wide exposure of the area of the brain in which the abscess is supposed to lie. This is best done by raising an osteoplastic flap. Some otologists, when operating for temporosphenoidal abscess, are in the habit of removing the bone in that region with rongeur forceps, thereby creating a defect in the skull. There are numerous objections to this procedure, the chief being that the exposure of a large area demands a wide removal of bone, and further, that such a large defect predisposes to the development of cerebral hernia. Again it is a more time-consuming procedure than is the raising of the osteoplastic flap.

2. The second, and a most important consideration, is the protection of the meninges against infection by the purulent contents of the abscess cavity. If this lies near to the cortex of the brain, or upon it, it is more than likely that the meninges will be protected from infection by a barrier of natural adhesions that have formed before the operation is done. These are the most favorable cases for surgical interference. When, however, the abscess lies deep within the substance of the brain and there is no such barrier of natural meningeal adhesions, the question arises, Is it not preferable to operate upon such cases in two stages? In the first stage open the skull and incise the dura, and by gauze packings around the margin of the

dural incision establish a barrier of protective adhesions between the pia and the dura mater, and at the second sitting, which might take place after 24 hours, incise and properly drain the abscess cavity.

3. The third consideration for the surgeon is the proper drainage of the abscess cavity. Here we must remember that there are two entirely different kinds of abscess cavities in the brain—one, with soft walls that readily collapse when the contained pus is evacuated; and the other with rigid walls that show no tendency to fall together, and that must be obliterated by the slow process of granulation. It is evident that an entirely different method of drainage must be employed in these two types. In the former, all that is required is the establishment of drainage by a thin slip of rubber tissue at the most dependent point of the cavity. This is to be removed after 48 hours and not reinserted. The opening in the scalp and skull, however, should be maintained by a piece of gauze packing, so that if pus or other secretion be retained it will find its way out along the tract established by the rubber tissue. In the latter type of abscess cavity the drainage must be by a tube of some kind, whether rubber or decalcified bone or other material, according to the choice of the operator. This tube must be inserted at the lowest point of the abscess cavity, otherwise there is bound to be retention of pus. Inasmuch as gauze ceases to act as a drain a few hours after its insertion, its use for drainage of such thick-walled brain abscesses is inadvisable. When the abscess occupies the temporosphenoidal or the occipital lobe, or the cerebellum, the drainage of the most dependent part of the abscess cavity is easily established through the primary wound, because this already lies at a point below the most dependent part of the abscess. This does not obtain, however, when the abscess occupies the frontal or the parietal lobe. In such cases the abscess is approached from the higher parts of the cranial vault, and its lowest part is often one or two inches in the depths of the brain, considerably below the lowest point of the primary wound. If we wish to establish satisfactory drainage under such conditions, it must be done through a counter incision, the site of which corresponds to the lowest point of the abscess

cavity. This incision may be made at the time of the primary operation, if the patient's condition warrants it, or at a later period.

Deafness Occurring During Osteomyelitis. Siebenmann[1] reports three cases of deafness occurring in the course of osteomyelitis. From these and the history of four cases previously reported by other authors, he attempts to develop a clinical picture of osteomyelitic deafness. All but one of the cases occurred in early life, the respective ages of the patients being 7, 7, 7, 15, 20, 24, and 40 years. This corresponds to the fact that acute osteomyelitis is more frequently observed in the first decades than in later life. There is no particular predisposition to either sex; at the same time, among these were five males and two females.

In all seven there was an acute osteitis, beginning with high fever, which lasted many months, and sometimes for years.

In three cases there was multiple localization of the foci; in four there was only one bone involved, viz., the femur; in two, the tibia; in one, the humerus. This predilection of acute osteomyelitic processes to the long bones, and especially to those of the lower extremity, is in accordance with the experience of general surgeons.

As regards the affection of the ears, it is noteworthy that in all the seven cases the deafness was bilateral. The first signs of the deafness appeared always during the course of bone suppuration, and in two cases during the first febrile period, not during the first day, but during the first weeks of the bone disease. In three other cases a year intervened between the bone suppuration and the inflammation of the ears. Castex's patient became deaf during convalescence, three years after the beginning of the disease. While in six patients the deafness appeared simultaneously in both ears, the course of one case was quite unusual, viz.: five months after the onset of the osteomyelitis in the febrile stage, one ear became affected; after 3½ years, in a febrile period, and after other osteomyelitic foci had appeared the other ear was involved.

In none of the cases was the middle ear involved. In

---

(1) Archives of Otol., December, 1907.

only one case was a bacteriologic examination made. This showed a pure staphylococcus infection.

The assumption that the labyrinthitis and not the neuritis is the cause of the osteomyelitic deafness is supported by the fact that both divisions of the labyrinth are involved to about the same degree.

This condition resembles that form of deafness which is observed in hereditary syphilis much more than meningitis deafness. The two processes, however, are not identical. In the author's cases, the previous history and the general examination showed not the slightest ground for this supposition, and this is probably true for the other observers. The initial febrile period of the bone disease, with its typhoid character lasting for days and weeks, is extremely characteristic and the deafness follows osteomyelitis much more promptly than in hereditary syphilis.

First, it seems that the same destructive action which the streptococcus exerts in septic ophthalmia is furnished by the staphylococcus for the labyrinth. Pyogenic staphylococci, which generally form fewer metastases than pyogenic streptococci, seem to be particularly irritating for the ear, much more so than for the eye. It is impossible to say whether in these cases of labyrinthitis there was a new bacterial invasion. In the majority of cases of bilateral septic panophthalmitis there seems to have been a more direct toxic inundation than a toxic action. This seems probable because the deafness generally is bilateral and simultaneous, and because the time at which the deafness occurred in half of the cases was long after the febrile stage had passed; in two, in fact, after years. On the other hand, these observations seem to confirm the opinion of the unusually long existing virulence of staphylococci and their toxins in the human body.

Functional Paralysis of the Auditory Nerve. F. G. Stubbs[1] reports three cases of functional paralysis of the auditory nerve and discusses such disturbances of hearing under three heads: (1) angioneurotic; (2) rheumatic; and (3) hysterical.

The angioneurotic form of functional acoustic paralysis is extremely rare and is probably closely associated with the sympathetic nervous system. It manifests itself in one or more attacks, each one lasting only a few minutes. They begin suddenly, with pallor of the face, ringing of the ears, dizziness, nausea, vomiting, and hardness of hearing, last a few minutes, and disappear with return of the normal color to the face. Urbantschitch has observed cases of tinnitus and hardness of hearing with accompanying severe pulsation of the carotid and marked reddening of same side of face, neck and auricle, and refers them to a vasomotor disturbance of the sympathetics, a spasm of the vessels in the region of the acoustic center, similar to the hyperesthesia or anesthesia which frequently is present in migraine or the deafness which is seen following fright.

---

(1) Laryngoscope, January, 1909.

The rheumatic form arises from cold, heat or in the course of other rheumatic manifestations. The paralysis may be of the acoustic nerve alone, or at the same time it may affect other nerves in close relationship with it, as the facial and the trigeminal. When the acoustic alone is affected it is more difficult to diagnose. Its manifestations will vary, depending on whether the cochlear portion of the nerve alone is involved, or the vestibular also. In the former case the disturbance of hearing comes on in a few hours to days, and may be moderate or extreme in degree. There is usually a marked tinnitus present. The tuning-forks give the usual reactions for primary nerve deafness, i. e., lateralization from vertex toward the normal ear, positive Rinne, lost or shortened perception through the cranial bones, and perception for the deep tones through air conduction. If the vestibular portion is also involved, we have severe dizziness, disturbance of equilibrium, an inability to stand with closed eyes or to walk straight, with nausea and evening vomiting.

The hysterical form of paralysis of the acoustic nerve appears as an acute hypesthesia or anesthesia. It may share in an hysterical unilateral hypesthesia or anesthesia of the whole body, or as a neurosis localized to the organ of hearing. This last form is very rare, especially when it is bilateral.

It is very frequently observed that hysterical patients complain of peculiar sensations in the ear, such as a feeling of tickling, creeping or flowing in the deeper portions of the meatus, painful constriction and pressure in the ear, and increased sensibility to noises, without any disturbance of hearing. Hysterical otalgia, especially in the presence of actual auditory disturbances, is quite common. But all these manifestations are separate and apart from hysterical hypesthesia or anesthesia. There should not even be present tinnitus or attacks of dizziness. In fact, Hammerschlag regards them as a sure indication of organic affection, even in an hysterical individual. After examining a large number of cases of hysteria, he found that a disturbance of hearing without any palpable change of the hearing apparatus constitutes a very constant symptom, and that, in spite of variability of the manifestations, there is a certain sharply defined symptom picture; also that hysterical anesthesia is much more rare than hypesthesia. Further, he found, as Frankl von Hockwart had already pointed out, that in hysterical hemianesthesia the ear (when at all) is affected on the disturbed side, but also in slighter degree on the opposite side. This corresponds to the limitation of the field of vision in analogous cases.

Balance[1] describes an operation which brings the symptoms induced by certain forms of internal ear disease within the control of surgery, in that such symptoms may be cured by *division of the auditory nerve* just as epileptiform tic in the territory of the fifth nerve is cured by dividing the nerve or removing the Gasserian ganglion. Just as in the division of the trunk of the fifth nerve we may hope some day to be able to spare the motor root, which is in no way concerned in the disease, so in division of the auditory nerve we may hope to be able to spare the nerve of Wrisberg, which is in no way concerned with auditory symptoms. Labyrinthine symptoms have their origin in the cochlear ganglion or in the vestibular ganglion, or in both ganglia, but we cannot yet think of a method for separating surgically the cochlear and the vestibular division of the auditory nerve so as to be able to spare the one or the other, as the symptoms may indicate.

Vertigo and Tinnitus Cured by Operative Destruction of Labyrinth. M. Yearsley[2] reports a case of severe vertigo and tinnitus cured by operative destruction of the laby-

---

(1) Lancet, Oct. 10, 1908.
(2) Lancet, Sept. 19, 1908.

rinth. His patient, a man 47 years old, had suffered for three years with incessant tinnitus and with attacks of vertigo about every six weeks. There was total loss of hearing for the voice. The radical mastoid operation was performed and the contents of the middle ear cleaned out. The promontory was exposed and the cochlea opened with a fine chisel and cautiously cleared out in the direction of the vestibule. The external semicircular canal was next opened and the posterior canal similiarly treated; the latter was followed to the vestibule, which was scraped with a fine spoon. The ampullæ of the canals were scraped with a sharp bent probe, and a probe was passed from the cochlear wound through the vestibule to the canal wound. The cochlea and vestibule were then swabbed out with a 2 per cent. solution of formalin, after which the auricle was readjusted and the wound lightly packed via the meatus. The patient made a good recovery, and five months afterward had had no return of the vertigo and but slight tinnitus. In the opposite ear, hearing had returned to a slight degree. It is Yearsley's opinion that attacking the labyrinth via the radical mastoid operation is more scientific, certainly more justifiable and less dangerous, than attempting to divide the auditory nerve where it enters the internal auditory meatus.

MISCELLANEOUS.

Cardiovascular Disease with Ear Symptoms. L. F. Bishop[1] has made a study of the ear symptoms of cardiovascular disease with special reference to the low-pressure cases.

Ear symptoms may be considered due to cardiovascular disease when they have developed coincidently with circulatory disorders and when they are not manifestly due to disease of the ear itself. The decision on this point must be determined by careful study on the part of the specialist in circulatory disease, with the cooperation of the aurist, and the final criterion must be the result of therapeutic measures. That a certain number of cases are due to circulatory disturbance is indicated by the fact that

---

(1) Jour. Am. Med. Assoc., Nov. 7, 1908.

audible murmurs are often heard in the circulatory system in cases of anemia and relaxed blood vessels.

Speaking of tinnitus, he says it would seem that each case should be analyzed according to the relations of three classes of causes. First, an increase in the noise of the circulation just as there is an increase in the noise of a railroad by loose rails or flat wheels. Second, an increased sensibility of the auditory nerve apparatus, whereby the physiologic noise of the circulation becomes the subject of a conscious appreciation. Third, disease of the ear itself outside of the nerve apparatus, stimulating this nerve and inciting its characteristic impression, just as a blow on the eye produces the sensation of light. The situation is complicated because we must analyze these three elements, and in many cases all three are active, but from this it is fair to suppose that when we influence one of them and there is an improvement in the symptoms, we have controlled a part of the trouble. The heart is usually competent to carry on the circulation, provided the condition of the peripheral vessels can be properly controlled.

There are three great important locations of vasomotor control; in the medulla and brain, in the spinal cord, and in the blood vessels themselves. The first to fail in severe disease is that in the medulla, and the author has recently studied cases of pneumonia in which the vasomotor control has been transferred from the medulla to the other two locations. In the low tension of the type in which circulatory ear symptoms were manifest, there seemed to him to be a combination of rather general vasomotor insufficiency, and a degeneration of the heart muscle. In other words, a weak heart in which compensatory constriction of the peripheral vessels had not taken place. The following conclusions are submitted:

1. There are certain cases of tinnitus aurium which are a local manifestation of general circulatory disorder.
2. This may have its foundation in arteriosclerosis, but the blood-vessel disorder is often, in a large measure, functional.
3. It is found in connection with high blood pressure and also with low blood pressure, and while in both instances the symptom is relieved by measures which regulate the circulation, the most striking results of treatment

are to be obtained at the present time in instances of low arterial tension.

4. Observations of blood pressure to detect the gross departure from normal should be made by otologists; they can be made in a very few seconds by the author's simplified method.

Suction Massage Apparatus of Stapler. M. M. Stapler[1] has devised a suction massage apparatus for the ears. It consists of four tubes, to be applied one to each ear and one to each nostril. These tubes are connected with a rubber bulb with valves for compressing and rarefying the air. On using the instrument the tubes should all be placed in position and suction made for the purpose of cleansing the tubes and accessory cavities of the head, i. e., middle ears, frontal, sphenoid, ethmoid and maxillary sinuses; to cause artificial hyperemia; to move all the movable structures of the ears, thereby breaking adhesions and giving a thorough massage. The ear tubes should be held by the patient, and the two nasal tubes in the left hand of the operator.

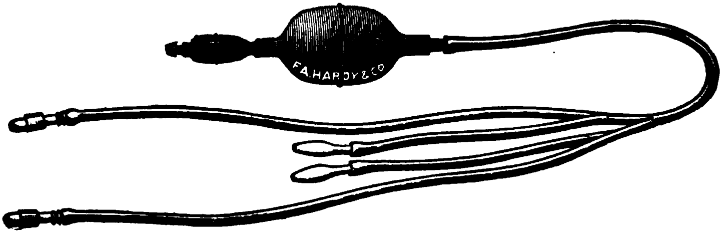


Fig. 14. Suction Massage Apparatus.

The air-bag should be held in the right hand of the operator and suction made in the usual way. Inflation should follow to dilate the Eustachian tubes and to reestablish the air pressure in the cavities. This may be done by attaching the inflation end of the air bag, which contains a sponge, or by attaching a compressed-air apparatus, to the rubber tubing. Medication may be given at the same time from a sponge in the hard rubber medicator

---

(1) Jour. Am. Med. Assoc., March 19, 1908.

or from compressed-air medicators. The ears are being properly reached only when the alæ of the nose are drawn down during suction and distended by inflation.

The special claims for the instrument are: It obviates the danger of blowing infected mucus into a closed cavity —the middle ear; it draws such matter away into the throat; it does not stretch the tympanic membranes, they are held passive in a rarefied or compressed atmosphere; it produces artificial hyperemia at the seat of the disease, as cupping would produce artificial hyperemia in any other part of the body; it offers an effective, safe and pleasant treatment of the ears.

THE NOSE AND THROAT

THE NOSE AND THROAT.

THE NOSE

EXTERNAL NOSE.

Paraffin Prosthesis. Harmon Smith[1] who is probably the best authority on this subject in this country presents a valuable paper in which he sums up the advantages and disadvantages in the use of paraffin to correct nasal deformities and describes the technic which he has found best.

Smith now uses a paraffin with a melting point of 115° F., although most of his work has been done with 110° F. paraffin. The permanence of results depends upon the melting point of the paraffin, the higher the melting point the more permanent the result. With paraffin of a very high melting point, however, there is more danger of fibrosis and keloid resulting and more danger of the mass acting like a celluloid or metal plate and subsequently ulcerating out. The paraffin should always be injected cold, a syringe or screw piston being used. Smith's syringe has a screw piston and a curved steel needle of large calibre about two inches long.

Too much stress cannot be placed on the selection of suitable cases for injection. The majority of bad results may be attributed to the improper selection of cases for operation. Syphilitic cases in which some activity is still present should not be injected, nor should any specific case be operated upon until a thorough anti-syphilitic treatment has been administered for some months. No case should be injected where all of the cartilaginous septum has been destroyed, as there is nothing below to support the paraffin above. No diabetic nor nephritic case should be injected as the low vitality of the tissues will not stand an increased

---

(1) Laryngoscope, October, 1908.

strain. Scar tissue is always poorly nourished and great care and judgment should be exercised in the attempt to liberate it from its source of nourishment and to make upon it an additional call for self-maintenance. Small quantities of paraffin should be injected beneath scar tissues at long intervals. No attempt should be made to inject beneath tightly adherent skin where an additional tension will occasion pressure, for in such cases necrosis is likely to occur.

The author is opposed to injecting any case unless deformity exists which detracts materially from the appearance of the patient and renders him peculiarly sensitive to his appearance. The injection of paraffin to overcome slight inequalities of profile and to gratify the whim of some over-sensitive patient is unwarrantable in view of the fact that quite a number of cases have proven unsuccessful in their ultimate outcome.

To prepare the patient, scrub the nose and adjacent areas with green soap and water; pour on some alcohol; cover the head with a towel wet with bichlorid of mercury, and cover the arms and shoulders with a sterilized gown. The same preparation should be made here as for any minor surgical operation.

Preparation of Instruments and Operator.—The paraffin syringe, which is of metal, and the needle should be boiled. The paraffin, which comes in sterilized tubes, should be again boiled in a metal cup, which can be placed in any sterilizer, the bottom of the cup being raised sufficiently to prevent the paraffin from scorching. The paraffin is drawn up into the syringe in a liquid state, after which the syringe is dropped into a receptacle of cold sterilized water, which soon solidifies it. The hands of the operator and the assistant are both sterilized.

Methods of Injection.—No anesthetic is necessary, although some operators prefer cocain locally injected. Smith has found the cocain as painful as the paraffin injection. The patient sits on a stool so that when the head is tilted backward the nose is about the height of the operator's elbow, with the arms hanging by the side. The operator stands on the left of the patient, and the assistant stands in front of and slightly to the right of the patient. The assistant grasps the nose firmly with the balls of his thumbs pressed against the nasal bones, and with the tips touching over the root of the nose. In this way pressure is exerted along both sides of the nose, and will prevent the entrance of the paraffin into the areolar tissue around the eye, and will also prevent it getting into the circulation, should the needle penetrate a small vein. Always inject from above downward, as this is in a direction away from danger, and towards nature's natural barrier—which is the adherence of the skin and cartilage of the tip and alae of the nose.

Before the introduction of the needle immerse it in hot water, and then give the piston several turns until the paraffin comes out in a hard cylindrical thread. The first few turns of the piston usually sends forth an interrupted stream of paraffin mixed with some oil and water, but in a few turns all of the oil and water have been expelled, and the paraffin remains, a solid block within the cylinder of the syringe.

At the point of injection lift the skin up high with firm pressure and introduce the needle beneath the skin and into the areolar tissue above the periosteum. The point of the needle is carried just beyond the depression, when the injection is begun slowly and is continued as the needle is gradually withdrawn. Frequently stop the injection and mould the paraffin to meet the requirements of the case. During this time a second assistant holds the syringe, or the first assistant relinquishes his pressure and holds it while the results are noted. Never make it an object to overcome the deformity at one injection, but in many instances one injection will be found sufficient. When anemia of the surface occurs stop further injection, as this is the danger signal that the tissue will stand no more. Withdraw the needle carefully and stop the hemorrhage, if there is any, with adrenalin, after which put on a little collodion.

A second injection should not be made sooner than a month afterward, for nature is having all she can do to take care of this first injection during this time, and any additional demand might result in necrosis.

Accidents.—The discussion under this head will be limited to those accidents resulting from injecting paraffin for the correction of nasal deformities.

Three cases of amaurosis from embolism following injection of paraffin have been reported. These are discussed by Smith, who believes he is warranted in saying that with the technic described by him such an accident would be practically impossible. There were faults of technic in each case quite sufficient to account for the accident.

A number of cases of abscess formation have been reported. Such a mishap is favored by unsurgical methods, resulting in infection; by a second injection following too closely on the first; by diabetes, nephritis and syphilis; by injecting paraffin into the skin instead of beneath it. Keloid has been reported as following injection, but Smith has never seen a case nor heard of a case occurring in the practice of any of his colleagues.

The possibility of cancer developing in the injected tissue has been suggested, but no definite case has been reported.

A new procedure for the correction of *saddle nose* is described by F. E. Waxham.[1] Two of the chief objections to the use of paraffin in these cases is the danger of the substance spreading into undesirable locations and of causing necrosis by too great pressure. The author overcomes these objections by making an incision through the skin at the root of the nose, separating the tissues with curved scissors or with the spud used in submucous resection of the septum, carefully raising and stretching the skin and subcutaneous tissues with an elevator. A warm sterilized solution of adrenalin (one to three thousand) is now introduced through the incision and retained for a few minutes. This controls the bleeding, contracts the blood vessels and thus lessens the danger of embolism. Paraffin at a melting point of 110° to 115° is now injected through a blunt-pointed slightly curved needle and deposited at the farthest portion of the separated tissues. As the needle is gradually withdrawn, more of the paraffin is deposited. Only slight pressure is required, simply sufficient to elevate the already separated tissues. To prevent the return of the paraffin through the incision, firm pressure is made at this point, or

---

(1) Laryngoscope, May, 1908.

the incision may be closed previously with fine sutures.

At a meeting of the Chicago Laryngological Society, J. Beck reported a case showing one of the dangers of paraffin injection. A nurse had injected paraffin into her own face in an attempt to eradicate wrinkles, with the result that wherever the injection was made a tumefaction occurred which Beck calls paraffinoma. This new growth did not show malignancy but was strongly suggestive of the possibility of such a degeneration occurring. Beck removed a considerable mass of the tissue from the neck.

The surgery of external nasal deformities receives very thorough consideration by J. C. Beck and J. O. Roe in articles in *The Laryngoscope* for Oct. 1908. Beck deals more especially with plastic operations for gross deformities while Roe deals chiefly with such deformities as can be corrected by his subcutaneous method. Both articles should be read by every one interested in this subject. The space devoted to this department does not allow of full quotation of the articles and they do not admit of abstracting.

FRACTURES AND DEFORMITIES.

Fractures. W. W. Carter[1] describes a *new method of treatment* for fractures and depressed deformities of the nose by the use of combined bridge and intranasal splints.

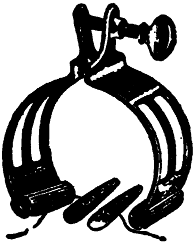


Fig. 15.

The bridge is made of steel, as light as is compatible with strength. It is formed by two curved, fenestrated wings 2½ cm. (1 inch) wide, joined by a hinge. The separation of

---

(1) Laryngoscope, September, 1908.

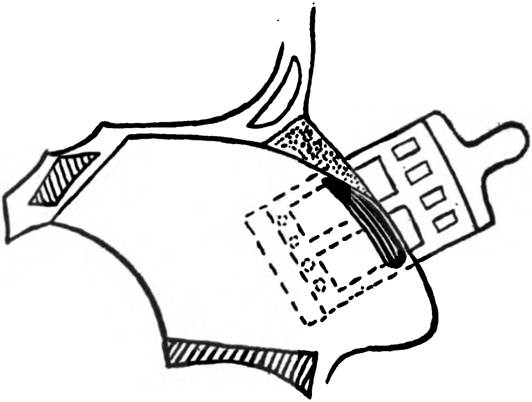


Fig. 16.

the wings is regulated by a thumb-screw. The edges of the wings which rest on the superior maxillary bones at either side of the nose are padded with rubber and near the margins are small holes which permit of additional padding of gauze being stitched on. The second part of the apparatus consists of two narrow hard rubber splints, perforated by four small holes.

The apparatus is applied as follows: No. 14 iron-dyed

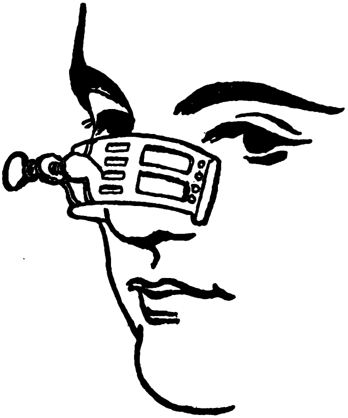


Fig. 17.

silk is passed through one of the perforations in the splint and knotted, (the hole is selected according to the distribution of the lifting force desired) the other end is threaded into a large curved needle. The needle is passed

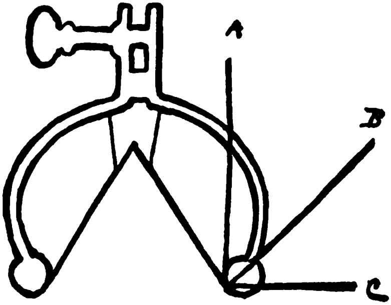


Fig. 18.

from within the nose through the dorsum, endeavoring to perforate the fibrous, triangular interval between the upper lateral cartilage, the lower lateral cartilage and the septum, and near the latter. The roof of the nose is thin and very easily perforated. The splint is now drawn into the nose and adjusted to the roof. This process is repeated on the other side. The bridge is then applied and the wings adjusted to give the proper support to the base of the nasal triangle. The sutures are now run through the fenestræ of the bridge immediately above their exit from the nose and drawn tight enough to lift the dorsum into its proper position and reduce the deformity (a slight over-correction is preferred). The sutures are then tied together over the hinge of the bridge, using only sufficient tension to support the dorsum. The apparatus should be worn for from one to two weeks, the patient remaining in bed during this time. Figures 15, 16, 17, and 18 show the instrument and its application.

PHYSIOLOGY.

The Nasal Air Spaces. The complicated structure of the upper air passages demands the assumption of a peculiar function. Those usually ascribed, viz., the warming and moistening of the inspired air are unsatisfactory because it has been shown that with mouth breathing the air is still sufficiently warmed and moistened and the breathing is much easier. P. J. Mink[1] discusses the subject first from the standpoint of anatomy. He describes the nasal cavity as a somewhat irregular triangular prism which has the average dimensions of 30, 45 and 67.5 mm. To this is added a triangular pyramid at the anterior end formed by the vestibule. This space can be roughly divided by a plane passing from the upper anterior angle to a line drawn across the posterior end about half way from the base to the summit into two portions which must serve different functions. The lower portion is fitted to serve as a passage for the air, but the upper is different in containing but little free space and in having in it the terminations of the olfactory nerves, in being connected with the openings of the accessory cavities, of which those of the antrum and frontal sinus are placed at the anterior end and those of the sphenoid sinuses at the posterior. The function of these cavities has been the occasion of a number of theories. Theory and experiment both indicate that with respiration an interchange of gases between the accessory cavities and the principal nasal space occurs. This is due to the fact that the negative pressure in the lung is communicated to the cavity of the nose so that air flows from the accessory cavities until the pressure in them becomes also a negative one. In the latter part of inspiration this negative pressure causes the introduction of the external air into the cavities. It has then been surmised that these cavities have an influence on the direction of the current of inspired air which Paulsen found was at first directed upward and then backward and downward toward the choanæ. By an ingenious apparatus Mink has been able to show that this is not the case, i. e., that the accessory cavities have no influence on the direction of the principal air current which depends chiefly on the force of suction exerted on the incoming current of air. By the same apparatus he was also able to demonstrate the fact that air entered small balloons made to represent the accessory

---

(1) Archiv f. Laryngologie u. Rhinologie, B. XXI, H. 2.

cavities and hence he concludes that a similar phenomenon occurs in connection with the entrance of air into the nasal passages. From this movement of air in the accessory cavities Mink concludes that their function is to assist in the appreciation of odors by drawing the air over the olfactory mucous membrane. It is not necessary for this function that odorous particles should actually enter the cavities, but a larger amount of them is brought in contact with the endings of the nerves.

The lower part of the nasal space serves for the entrance and exit of the air in respiration. In inspiration the direction of the incoming stream is determined by the direction of the inlet and the force of the inspiration from the pharynx. Both these factors tend to make the air flow along the septum through the olfactory fissure. This space is, however, not large enough for the entrance of a large volume of air and in ordinary breathing it appears that the air flows through the upper part of the respiratory region of the nose, descending as low as the upper part of the lower turbinated body occupying besides the olfactory fissures the middle meatus of the nose. This the author calls the respiratory zone. In this region certain hindrances are introduced partly constant and partly variable, the variable factor being introduced by the erectile tissue. That this tissue is controlled by the vasomotor nerves and stands in some relation to the respiratory effects on the blood pressure apparatus is evident. The purpose of dilatation seems to be to maintain a constant rate at which the air shall be inhaled. It appears to be influenced also by the character of the air, by psychic and probably by reflex nervous influences. The expiratory current pursues a different path in leaving the nose. It takes the most direct route and only when the expiratory force is above the average does it enter the zone which is occupied by the inspiratory current. The expired air passes for the most part along the floor of the nasal cavity and a part of it is deflected toward the olfactory fissure when it has reached the vestibulum. This expiratory zone is largely obstructed by the lower turbinated body the mucous membrane covering which is provided with some erectile tissue which appears to be capable of swelling under venous pressure and of relaxing when the pressure is lessened by the tonic contraction of the muscular walls of the veins. The venous pressure stands in relation with the force of expiration so that the hindrance to the escape of air is automatically produced when the expiratory pressure in the chest is inaugurated by the contraction of the lungs and the respiratory muscles. The effect of this regulation of the pressure and obstruction to the outgo of the air causes a constant volume of air to pass through the nose in a given time. This appears to be the physiologic significance of the erectile tissue of the nasal cavities.

THE SEPTUM.

Submucous Resection. J. E. MacKenty[1] offers some suggestions regarding this operation with a plea for a *more rapid technic.* It is recognized that the nervous strain and shock are greater the more prolonged the operation. The author states the chief time-saving factors in the operation are:

1. Judicious selection and use of instruments.
2. Perfect anesthesia.
3. Thorough adrenalization.
4. The avoidance of cocain poisoning.

The list of instruments is short, comprising only six articles.

Greatest stress is laid on the matter of anesthesia and adrenalization. Unless the anesthesia be perfect from the beginning to the end of the operation it will be impossible to work rapidly and much time will be wasted in recocainizing. A 10% solution of cocain is used on pledgets of cotton laid snugly against both sides of the septum, well above, behind, and below the deformity to be removed. Care must be taken to thoroughly cocainize the base of the septum, since it is in the removal of this portion that pain is most acutely felt and difficulty and delay are encountered. To avoid any unnecessary absorption of cocain none should be allowed to drip into the nasopharynx while the pledgets of cotton are being placed in position, therefore,

---

(1) Am. Jour. of Surg., May, 1908.

after each application the patient is instructed to bow the head forward until the next pledget is ready. This is repeated until all the pledgets are in place. Then the patient is instructed to lean well forward with the head almost between the knees until the cocainization is complete. This last procedure has done more in the experience of the author to prevent cocain poisoning than any other measure he has tried, having encountered no troublesome cocain symptoms since its adoption. About fifteen minutes should be allowed for the cocain to thoroughly anesthetize the mucosa and bone. Adrenalin chlorid (1-1000) is then applied in the same way for five minutes. This is removed and if the patient shows no symptoms of cocainism apply, with a small piece of cotton on an applicator, some pure cocain powder, rubbing it well into the mucosa over the deformity and beyond it in all directions and well into the floor. Then the parts are carefully wiped with dry cotton to remove any excess of cocain remaining from the last application. Adrenalin is again applied for a few minutes. The field is now ready for the operation.

Thorough adrenalization of the nasal cavity is necessary in time saving. The pledgets of cotton should be thoroughly wet. MacKenty does not hesitate to use half a bottle of adrenalin in preparing the nose for operation. This does away with the necessity of constantly sponging blood from the field of operation. There must be few cases in which adrenalin does not take effect. The adrenalin is used twice,—first, after the application of the 10% solution of cocain; and second, after the application of the pure cocain; taking it from two different bottles to make sure of its activity. In cases where the mucous membrane is not blanched by this application, adrenalin 1-3000 is injected underneath the mucosa. This has never failed to render the field bloodless.

The incision through the cartilage is made with a curette which should be of the round-bowled variety and sharp, the author believing that perforation of the mucous membrane is more likely to occur with a dull curette on account of the pressure necessary. The cartilage should be attacked boldly and the button removed in one movement. Scratching through is a waste of good time.

C. W. Richardson,[1] after doing several hundred of the older septum straightening operations, began the *submucous resection* and has used that method in 190 cases so that he is well able to pronounce on the relative merits of the older procedures and the window resection. After using local anesthesia for a time he began operating under general anesthesia and prefers the latter because of the greater comfort of the patient. In the 190 cases he has had 8 perforations, but as with all other operators his perforations occurred chiefly in his earlier cases.

Richardson uses a modified Killian incision but makes it further forward. Should a perforation occur then in going through the cartilage he makes another incision further back. If a permanent perforation seems inevitable he abandons the submucous operation and uses one of the older methods. [The use of a curette to make the opening and the Editor's blunt-angular knife to complete the vertical incision in the cartilage makes perforation practically impossible.] The author well says, "I know of no operation in which an operator has to be so 'keyed' up and so carefully has to scrutinize every move in the technic as is required of a surgeon in this operation."

Conclusions:

"1. The old method gives a septum maintaining its anatomical integrity. The submucous operation gives a flaccid septum, minus certain elements formerly considered essential to its anatomical integrity. This removal of the cartilage and bone seems to have no influence upon the function of the parts, unless removed over too great area toward the dorsum of the nose.

"2. The operation by the old method requires about ten minutes in its consummation; the submucous requires about one-half hour in actual operating time.

"3. The old method requires the wearing of a splint for a week or ten days; the packing in the submucous operation is removed in twenty-four hours.

"4. In the old method there is considerable pain and discomfort until the splint is removed; in the submucous there is no postoperative pain.

"5. In the old method of operating the patient is con-

---

(1) Am. Jour. Med. Sci., March, 1908.

fined to bed for several days, and is uncomfortable and feverish until the splint is removed. After the submucous operation the patient is out of bed at the end of twenty-four hours, and at the end of forty-eight hours is practically well.

"6. The old method is rarely attended with perforation. I have had only two in my whole experience. Theoretically, the submucous method should be attended with like results; practically, perforations do occur. After performing one hundred and ninety operations by the submucous method and nearly twice as many by the older method, I have become firmly convinced that the submucous method offers the greatest advantages to the patient afflicted with a deflected septum, in the hands of an operator thoroughly skilled in its technic. I know of no operation wherein unskilled and inexperienced hands can do more harm than by this operation. I feel as though I am becoming a strong advocate of the submucous operation, because it gives less discomfort to the patient, it taxes the skill of the operator, and, when satisfactorily done, gives excellent results."

THE TURBINATE BODIES.

Inferior Turbinal Applying the principles used in submucous resection of the septum, H. V. Wurdemann[1] does a *submucous resection of the inferior turbinal* where it is desirable to remove a portion of this body. He makes an incision along the lower edge of the bone, then with an elevator denudes the bone as high as desired, raising the mucous flap well up into the middle meatus out of the way. The knife is now inserted beneath the turbinal and a cut made through to the bone along the line of the proposed removal of the bone. The bone is next removed by means of a saw or alligator forceps and the mucous flap is brought down so as to cover the wound. It is held in place with gauze or a compressed cotton tampon. The author removes the packing daily, washes the nasal cavity and reapplies packing. Healing usually occurs in 3 or 4 days.

---

(1) Laryngoscope, April, 1908.

In this volume for 1908 Linhart's method of reducing intumescence of the inferior turbinals by dissecting up the membrane and curetting the bone surface with a hatchet-shaped knife was given. At various times submucous cauterization for intumescence has been brought forward but when practiced in the usual manner the submucous cauterization usually results in permucous cauterization.

H. Horn[1] now describes a method by which the mucous membrane will not be burned and one which offers decided advantages in simple intumescence of the inferior turbinals. After cocainizing, a small vertical slit is made in the mucous membrane and through this with a Freer elevator the membrane is dissected loose from the bone as far back as possible. The electrode is now introduced as far back as the dissection has been carried, the current turned on and with the heated blade turned to the bone surface the electrode is slowly drawn forward, the current being turned off just before the entrance point is reached. It is essential that the hot wire be backed by one which remains cool so that the mucous membrane shall not be burned. A moderate gauze packing will help to hold the mucous membrane against the burned surface till adhesion occurs, although since the author does not mention this it may be unnecessary. The author states the advantages of the method to be:

1. Complete healing takes place in from three to five days.
2. The swelling after the operation is practically nil.
3. The mucous membrane remains intact throughout its entire length.
4. The wound is aseptic. The entrance point closes of itself.
5. Adhesions with the septum are impossible.
6. The physiologic functions of the mucous membrane are preserved.
7. The burning takes place only in that tissue which it is intended to destroy: The cavernous tissues of the turbinate.
8. The shrinkage is complete along the entire length

---

(1) Annals Otol., Rhinol., Laryngol., June, 1908.

of the turbinate, and an ideal and permanent air space is the result.

9. So far no complicating tonsillitis, middle ear inflammations, or adhesions have been observed.

10. Burns of the septal membrane are absolutely avoided.

11. The disagreeable smell of the burning tissues and the occluding smoke are done away with.

12. If the patient fails to return for treatment no harm can result.

ACUTE RHINITIS.

Acute Rhinitis. A very complete study of the *common cold* has been made by R. W. Allen[1] who very aptly quotes from Prosser White: "I venture to submit that our zeal and interest in a disease should be proportioned not to its rarity but its frequency; and to call trifling, a disease which incapacitates members of every class of society oftener and more commonly than any other, and has the reputation of initiating so diverse and numerous ailments, is a travesty of facts. This condition, the bane of the household and the scourge of the community is allowed to run riot, practically ignored by our leaders, our medical schools and our text-books."

Allen's work consisted largely in determining *the bacterial etiology of colds* and in developing *a method of cure by vaccination.*

He summarizes his results as follows:

1. It has been shown that there are at least five organisms capable of the production of an attack of acute nasal catarrh—viz.: (1) the bacillus influenzæ; (2) the bacillus septus; (3) the bacillus of Friedländer; (4) the micrococcus catarrhalis; and (5) the micrococcus paratetragenus. 2. These may be present in the naso-pharyngeal space in a certain percentage of cases which exhibit no pathological features; increase of virulence and lowered resistance of the tissues may then light them up into activity. In other cases the infection is one from without. 3. Each organism produces its own type of cold and a differential diagnosis of the organism is possible from a consideration of the

---

(1) Lancet, May 28 and Dec. 5, 1908.

clinical features; this is more difficult should the infection be a multiple one. 4. This differential diagnosis is of considerable value both in prognosis and in treatment. 5. Chronic nasal catarrh is probably always due to infection by the bacillus of Friedländer, unless the Eustachian tube and middle ear be involved by the micrococcus catarrhalis; chronic tracheal catarrh to infection by the micrococcus catarrhalis or micrococcus paratetragenus to which secondary infection by staphylococci, streptococci, pneumococci, and other pathogenic organisms may be superadded. 6. For infection local defect of opsonin and for cure increase of opsonin are probably necessary conditions. 7. By means of the injection of the corresponding bacterial vaccines an attack of acute cold due to any given organism or organisms can be considerably shortened and complications be probably prevented. 8. In a similar manner chronic infections may be cured. 9. By injection of the vaccines of the several organisms in appropriate doses and at appropriate intervals considerable if not complete immunity against future attacks of acute cold may be secured. In those who are very susceptible and fall victims to every epidemic that may occur, the best procedure probably is systematic immunisation every four to six months against all the "cold" organisms and special immunisation against the particular organism or organisms which may be responsible for the appearance of subsequent epidemics against which protection is desired.

The author found it best to prepare the vaccine used from the organisms isolated from the patient to be treated.

The following table shows the opsonic index during an acute attack due to the bacillus of Friedländer:

Third day of cold. Cold began on 16th inst. Index before attack 1.25.

2 P.M.	18th	Index = 1.17
11 P.M.	18th	" = 1.05
10 A.M.	19th	" = 1.26
10 P.M.	19th	" = 1.07
10 A.M.	20th	" = 1.07

The subacute stage began on the 20th.

4 P.M.	24th	Index = 0.96
Noon	26th	" = 0.89
"	27th	" = 0.93

Injected with 300,000,000 at 2 a. m. on the 28th inst., as the subacute stage had become distinctly annoying to the patient.

2 A.M. 28th, before injection..............Index = 0.87
After 8 hours............... " = 1.9
" 18 hours............... " = 2.14
" 32 hours............... " = 2.4

Nose quite sterile and cold perfectly well.

The author gives his *conclusions regarding vaccine therapy* and the rules of its use.

A. Acute colds.—It would appear that by the injection of an appropriate dose of the corresponding bacterial vaccine convalescence in acute attacks of cold can be markedly hastened and complications obviated. At first the attempt was made, not only to deal with the present attack but also to secure immunity at the same time against the other organisms as well. The result of this was, as mixed stock vaccines were usually employed containing equal numbers of the several organisms, that a dose which was appropriate in an acute attack due to one given organism would contain insufficient numbers of the other organisms to secure future immunity against them. For instance, in a "catarrhalis" cold, a dose of 125,000,000 of micrococcus catarrhalis would be given; this sufficed for that infection, but the dose of 125,000,000 of bacillus septus simultaneously given would not suffice to secure immunity, say, for more than three months against this latter organism. Accordingly now the present infection is alone dealt with at first, and an attempt made three weeks later to secure complete immunity by the administration of a dose of 250,000,000 of each of the "cold" organisms.

The best times for dealing with an acute attack are either immediately at the onset or upon the third day. At the former period the cold may be completely aborted; at the latter the onset of the subacute stage may be obviated and convalescence be complete within from 24 to 36 hours. Inoculation during the interval between the first and third day is not free from risk of causing considerable constitutional disturbance. The appropriate doses to employ are 250,000,000 of bacillus septus and 125,000,000 of either the micrococcus catarrhalis or bacillus of Friedländer. Should the accurate diagnosis of the infecting organism or organisms not be possible a dose of 75-125,000,000 of the combined vaccine of the several "cold" organisms may be given with safety. As a rule, repetition of the dose has not been found necessary, but should this be so then 500,000,000 of the bacillus septus or micrococcus catarrhalis may be given at the end of a week and 250,000,000 of the bacillus of Friedländer at the end of a fortnight.

To secure immunity against future attacks the administration of a dose of 250,000,000 of each of the several organisms every four to six months will probably suffice, the first being given three weeks after recovery from the acute attack. Should this dosage produce any marked constitutional disturbance then a diminished one must be employed upon subsequent occasions.

B. In chronic colds.—Of the four cases of truly chronic colds treated the treatment of one was recognized at the beginning as likely to prove very difficult from the presence of complications and probable secondary infections. It is still under treatment with hope of ultimate success. One has been absolutely cured, a second practically so, and the third greatly benefited, and in all acute exacerbations have been obviated. Injections in the case of chronic colds should be controlled by determinations wherever possible of the opsonic index; if the condition be one of chronic tracheitis this can hardly be done as the infection is usually a mixed one, unless the index be taken towards the micrococcus catarrhalis alone. Doses of 500 millions of a vaccine of the mixed organisms obtained from a 12-hours' culture on blood-agar of the tracheal mucus may be employed in cases of chronic tracheitis.

In chronic nasal catarrh secondary infection may be present, but the first thing to be done is to get rid of the bacillus of Friedländer by injections controlled by the index and then to deal with the secondary infection.

As regards *the drug treatment of colds* the author favors the use of oil of cinnamon or oil of eucalyptus but in much larger doses than ordinarily given. Of the oil of cinnamon he gives 20 minim doses in milk hourly for three doses, then 15 minims two-hourly for two doses, then 10 minims every three or four hours. If the patient can take at once to bed cure is usually complete in 36 to 48 hours. He has had some remarkable cures of very severe colds in even less time than this and has never seen any ill effects. Oil of eucalyptus requires more care in its use and a pure oil alone should be employed. Ten to fifteen minims on sugar every three or four hours is a proper dosage and the drug is also used by steam inhalations.

CATARRH FROM COLD.

Winter[1] discusses the mode of origin and nature of catarrhal affections due to cold. That the application of cold to the external skin may cause hyperemia of the respiratory mucosa has been shown experimentally by Rossbach who placed ice on the skin of the abdomen of rabbits and observed the effect on the mucosa of the opened trachea. After a short period of pallor the mucous membrane became red and afterwards took on a dusky hue indicating venous congestion. These changes correspond to an initial contraction followed by active dilation of the blood vessels ending in paralysis which was accompanied by all the signs of inflammation including the effusion of an altered secretion, characteristic of catarrh. The changes are to be referred to a reflex from the skin acting on the vasomotor center. A similar change takes place by exposure to cold in man, the effect being most frequently exerted on the mucous membrane of the nose. The occurrence of bacteria in the altered secretions poured out by the inflamed mucous membrane is not according to Winters' evidence of their initial causative agency, but he believes that the resistance of the mucous membrane being reduced by the congestion, the microörganisms find a suitable medium in which to increase and exert their pathogenic properties. The reason why one part is affected rather than another is difficult to explain. Partly it may be due to the part of the skin on which the cold acts, partly to other circumstances which conspire to bring about a pathologic condition of the special organ which renders it more susceptible to the reflex influences resulting from the action of cold. In the air passages, adenoids or other influences which obstruct nasal breathing favor the localization of the catarrh in the nose. When the bronchioles have become affected the swelling of the mucous membrane tends to obstruct the entrance to the alveoli, which are therefore placed under conditions

---

(1) Klin.-Therap. Woch., Aug. 10, 1908.

favorable to the spread of the catarrh to the alveoli. The anatomic distinction between the circulation in the bronchi which belongs to the general circulation and the circulation in the alveoli which are supplied by the pulmonary artery gives occasion to a distinction in the gravity of the affections of the two parts. When the disease passes over into the region supplied by the lesser circulation the condition assumes a much graver aspect.

FUNCTIONAL NASAL IMPOTENCY.

R. Foy[1] calls attention to a class of cases in which in consequence of some previous obstruction of the nasal passages the patients who are mentally deficient or of a hysterical character are unable to breathe with the mouth closed, although no obstruction to breathing through the nose can be discovered on examination. The patients were all women varying in age from 16 to 32 years. In most cases there had been a previous nasal obstruction which might account for the origin of the habit of mouth breathing, but in all cases the nasal passages were continuously free and in some cases larger than normal. In all there was absolute inability to breathe through the nose, extending to cyanosis and asphyxia when the mouth was forcibly closed. In none of the five cases could a spasm of the velum palati be discovered as a cause of the trouble. In all the cases the sensibility of the nasal mucosa was diminished; in some there was anosmia. All the patients showed defective power of attention.

The pathogenesis of the condition seems to be that the patient for some reason is forced to breathe through the mouth and forgets how to breathe in the instinctive and normal way. Foy treats these patients by a reëducation which involves a psychic and a motor phase. He gains the confidence of the patient and removes the fixed idea of her inability to breathe through the nose. By a series of exercises he is able to restore the lost habit of nasal breathing.

---

[1] Annales des maladies de l'oreille, du larynx, etc., October, 1908.

ATROPHIC RHINITIS.

Etiology. M. Steiner[1] analyzes his cases of ozena with some results of interest. He reports on 34 cases. The majority were under 20 years of age and of the female sex. In 17 cases he found a special type of countenance, having a narrow face with sunken flat nose and the orbits close together. In 8 others the nose was deeply set, but the roof, looked at from in front, was concave. In 5 cases there was no special type and in 2 the nose was thin. In the author's opinion the secretion may come either from one of the cavities or from the mucous membrane of the principal cavity of the nose. In either case if the secretion be kept a few days the characteristic fetid odor develops. In 15 per cent. of the cases there was an empyema of one of the cavities. The author reports a case in which one-half of the nose was mechanically distended by a tumor which merely exerted pressure. The patient was otherwise healthy. The tumor was removed by operation and ozena developed, crusts being formed with the characteristic fetid odor. In this case the patient did not present the characteristic features of ozena patients. Steiner also reports two other similar cases in which the ozena was the artificial result of enlarging the nasal cavity. The attempt to distinguish these and similar cases which result from syphilis from genuine ozena is not favored by Steiner. There can be no ground for this except that we know the cause of the syphilitic ozena and do not know the cause of the genuine form. The symptom complex which results from atrophy of the nasal mucous membrane and the formation of crusts may be due to various causes. The author distinguishes four forms of ozena: 1. Fraenkel's form, probably of congenital origin. 2. The purely mechanical form produced by pressure and enlargement of the cavity. 3. Grünwald's type, depending on empyema of one of the accessory cavities or of some other chronic suppurative process (adenoid vegetations, pharyngeal bursa, etc.). 4. A form allied to the last in which there is syphilitic disease of the bones.

---

(1) Archiv f. Laryngologie u. Rhinologie, B. 21, H. 2.

While most authors attribute to syphilis only a minor part in the production of ozena, O. Frese,[1] on the basis of a long experience and from the analysis of 61 cases, comes to the conclusion that *syphilis is one of the most important factors* in the production of the disease. As ozena is usually established as early as puberty, its syphilitic basis in the majority of cases must be congenital. Among his 61 cases hereditary syphilis could be positively established in 5 cases and with great probability in 11 more. No case of acquired syphilis was found. Probably in other cases a syphilitic history would have been shown if reliable data could have been obtained. No other definite cause could be established for any of the cases unless in the cases which followed infectious diseases.

The author believes that the syphilis leads to a specific affection of the nasal mucosa, which leads to atrophy and consequent formation of crusts, accompanied by fetor. When syphilitic lesions are present they may be cured by antisyphilitic treatment, but atrophy of the mucous membrane is uninfluenced by therapeutic measures. An analogous process occurs in adults after local tertiary syphilitic processes in the nose.

F. Perez[2] expands his theory of the *contagiousness of ozena* and especially its derivation from dogs, and advises the following prophylactic measures: 1. Prevent the association of dogs with persons and especially with infants. 2. Avoid the intimate and prolonged association between patients with ozena and healthy individuals. 3. Disinfect handkerchiefs and other articles of the toilet and the table used by patients suffering from ozena. 4. The author favors the use of paper handkerchiefs, which can be burned after using.

A symposium on atrophic rhinitis is given in *The Laryngoscope* for June, 1908. C. F. Theisen takes up the question of etiology and inclines to the view that at least a *large proportion of cases are due to sinus disease.* He does not believe that any other theory can account for the large amount of secretion present in many cases. D. B. Kyle states that atrophic rhinitis generally begins in childhood

---

(1) Archiv f. Laryngologie u. Rhinologie, B. 21, H. 3.
(2) Annales des maladies de l'oreille, du larynx, etc., April, 1908.

and that the general condition and heredity play a considerable part in the etiology. There is no single cause. There may or may not be associated sinus lesion, either primary or secondary to the atrophy or ozena. There is an atrophic condition which follows a simple chronic inflammation with contraction and there is an atrophic condition due to faulty nutrition from other causes. No specific bacteria will account for all cases of atrophy of the mucous membrane or all cases of ozena.

Clinical Course of Rhinitis. R. E. Myles divides the clinical history of the true or typical rhinitis into three stages:

First. The mucopurulent stage of childhood.

Second. The incrustation or ozena stage, which develops in patients between 4 and 16 years of age, and never afterward in patients observed by him.

Third. The less active stage, which may be observed from the age of 25 to the end of the oldest life.

He believes that atrophic rhinitis is essentially an infectious disease of childhood. He views nearly every case of bilateral perennial suppurative rhinitis in children as a possible atrophic case and directs treatment with this in mind.

Treatment. The nose is first cleansed with a quite warm alkaline spray or the solution is used with a pipette. After cleansing, about ½ grain of a powder composed of 1 part of boric acid to 2 parts of aristol is blown into each nostril by the nurse or the child itself, once daily at bedtime. After the morning cleansing one of the following ointments is used, being applied by means of a cotton pledget:

℞
Ichthyol, drams j or ij
Lanolin, drams ij
Vaseline, white. ad. oz. j

or ℞
Nosophen, grains xxx
Lanoline, drams ij
Vaseline, white, ad. oz. j

After this, two or three times a day, an albolene spray with one grain each of eucalyptol, phenol and menthol to the ounce, is used.

When the little patients come to the office, usually at very irregular intervals, the recesses are cleaned with cotton applicators dipped in various astringent and antiseptic solutions. Myles likes a 25 per cent. to 50 per cent. solution of argyrol as being the least irritating.

The suggestions for the treatment of the second and third stages by the various speakers presented about the usual methods of cleansing and stimulating.

A *new treatment* for this disease as well as for other suppurative conditions of the nose, throat and ear is reported by H. H. Curtis.[1] The agent used is a fresh culture of *lactic acid bacilli.* The author believes the results secured warrant the belief that a very valuable advance has been made in the treatment of pathogenic conditions of the nose and the adnasal cavities. He reports seven cases treated by the method and says that after a very few injections the pathogenic bacteria have been entirely destroyed and a sterile condition of the secretions produced.

Injections by means of a catheter into a profusely discharging frontal sinus have caused a diminution of the discharge, amounting to 90 per cent., after the second dose of a cubic centimeter of the culture; and this in a case of over a year's duration. In several instances of chronic ethmoiditis with profuse postnasal discharge, the condition has been so relieved that the patient has asserted himself entirely cured.

Of especial benefit it seems to be in the treatment of the early stages of atrophic rhinitis. In these cases the crusts liquefy and the nose presents an entirely different appearance after two or three applications. It is too early to state that there has been an actual cure in any of these cases, but the evidence has been so strong that it would seem to point to ultimate good results. He has no hesitation in saying at this stage that there is no topical application which approaches in any manner the efficacy of the lactobacilli culture in the treatment of mucopurulent secretion from the nose.

---

(1) N. Y. Medical Record, July 11, 1908.

The method of application has been as follows: In the nasal cavity a cubic centimeter of the culture broth has been sprayed under pressure on either side of the middle turbinate, in order to reach the anterior and posterior cell orifices, the theory being that the bacilli will find their way into the ethmoid cells and the accessory cavities, and by their secretion destroy the pyogenic bacilli which are causing the disease. A sterilized narrow test tube into which has been poured a cubic centimeter of the culture admits a sterile Sass spray tube and makes the application of the medium by compressed air pressure very convenient. In the sphenoid, frontal, and maxillary sinuses the culture may be syringed through the metal catheters appropriate to the locality. It is too early to state what improvement, if any, may be expected from this treatment in cases where there exists necrosis of the bone, but where the disease is confined to a pus-secreting membrane in the accessory cavities, it promises most excellent results.

The subject was again discussed by Curtis[1] before the New York Academy of Medicine several months later with still greater enthusiasm. After much more extended observation of the treatment he says: "I unhesitatingly claim that it is the best means we have at our command in combating that most distressing disease, ozena, accompanied by crust formation, and for the topical treatment of suppurative disease of the ethmoid cells and frontal sinuses." Patients were exhibited showing the results of treatment. Several other speakers stated that they had recently been trying the remedy and found it quite satisfactory.

The cultures used were supplied by Dr. C. E. North, who first suggested the treatment to Dr. Curtis, from the Lederle Laboratory. The bacillus is cultivated in ordinary broth culture and the broth with the living bacilli used. As used the broth contains about 2.1 per cent. of lactic acid, but some other product than the acid in the culture seems to be the effective agent, as lactic acid used alone does not produce any special results.

Curtis found in several experiments on his cases that a too frequent use of the preparation was bad. Every

---

(1) Laryngoscope, December, 1908.

other day in some cases is better than every day, even in cases of ozena.

[It is to be hoped the preparation may soon be made generally available commercially.—Ed.]

R. H Skillern and E. Burvill-Holmes[1] treated two very severe cases with a *vaccine* prepared from cultures of bacteria taken from the diseased membranes. Improvement of marked degree took place in both cases, but too large doses caused an exacerbation. After an interval without treatment smaller doses again caused improvement.

S. H. Large[2] has treated 14 cases by *paraffin injections*. These patients had a troublesome winter cough on account of which the injection was chiefly done. Of the 14 cases, 8 were relieved of the cough and 4 greatly benefited, while 2 were not relieved in the least. The 2 latter were far advanced cases, with almost complete atrophy of the inferior and middle turbinates, which permitted of the injection of only a few drops of paraffin. The following is the author's technic:

The mucous membrane of the anterior end of the inferior turbinate is cocainized with 5 per cent. solution, after which a pledget of cotton, saturated with solution adrenalin chlorid (1-1000) is inserted and left for 10 minutes.

An applicator wound with cotton, containing a solution of bichloride of mercury (1-3000) is gently rubbed over the mucous membrane, where the puncture of the hypodermic needle is to be made. The syringes, two in number, one large and one small, are boiled. The small one, which must have a glass barrel, is filled with Schleich's solution. The hypodermic needle must be adjustable to either syringe, and must be at least two and a half inches long; an aspirating needle is very good.

The needle attached to the small syringe is inserted under the mucous membrane of the anterior end of inferior turbinate, and is carried backwards to its posterior end. A few drops of the Schleich's solution is now injected, and then aspirated. If the fluid remains clear in the barrel of the syringe, it shows that you have not penetrated the walls of a blood vessel.

---

(1) N. Y. Medical Jour., Aug. 15, 1908.
(2) Laryngoscope, March, 1909.

The large syringe containing the paraffin, which is allowed to become semisolid, is attached to the needle which has been left in situ. The paraffin is injected slowly, and the desired amount is injected from behind forwards. Great care must be taken not to inject too much at one sitting. Flexible collodion is applied to point of entry, and ice is applied to the nose for 30 minutes.'

There was a diminution of crust formation in 8 cases, no diminution in 6.

The author believes the results secured are such as to warrant the treatment in suitable cases. In far advanced cases and in those due to syphilis or tuberculosis or to sinus empyema, the operation does not promise much and is hardly proper.

Atrophic rhinitis often exists as a unilateral affection and if there is a deviated septum the atrophy is nearly always on the side of the concavity. Mermod[1] calls attention to this fact and suggests a method of treatment which he has tried in several cases with excellent results. He describes 4 cases in which such a unilateral ozena was present and in which he *straightened the septum by submucous resection,* with the result that the crusts and foul secretions stopped forming and the mucous membrane became healthy. The author's statements merit consideration and will doubtless be speedily confirmed or refuted by other operators.

THE ACCESSORY CAVITIES.

PHYSIOLOGY.

In considering the accessory cavities of the nose, especially the maxillary, the sphenoid and the ethmoid, one is, on first thought, tempted to believe that the arrangement for drainage might have been better, since in these cavities the openings are placed much above the lower parts of the cavities. These cavities are often involved in nasal inflammations and it would seem almost impossible for them to return to natural conditions without surgical assistance. Yet the fact is that in only a very small percentage of

---

(1) Annals of Otol., Rhinol. and Laryngol., December, 1908.

infections is nature unable to restore the health of the parts without assistance. S. Yankauer[1] has performed a valuable service by taking up in detail the natural agencies by which the accessory cavities are drained. In the opinion of the editor this is one of the most noteworthy articles of the year and is well worth the large amount of space here devoted to it.

Only a small portion of the fluid excreted from the nose comes from the accessory sinuses. In the nasal passages this fluid disappears by evaporation; but as the conditions for evaporation are not favorable within the sinuses, it follows that the secretion of the sinuses must be discharged into the nose. The fact that the sinuses are thus capable of draining themselves when they are in a normal, healthy condition will hardly be disputed; but that they are also capable of emptying themselves through their natural orifices when they have become diseased may not be so self-evident. Yet it is within our experience that acute inflammations of all the accessory sinuses have a natural tendency to get well without operative interference, the end of the disease being marked by a discharge of secretion into the nose, lasting for days or weeks, during which time drainage through the natural orifices goes on without interruption; so that even when the mucous membrane is diseased and the quality of the secretion altered, drainage through the natural orifices is possible, and in a large percentage of the cases is sufficient. We may, therefore, assume that in these cases the normal drainage mechanism has not been destroyed, and by following the course of the secretion in these cases some light is thrown upon the mechanism of normal drainage.

The first factor to be considered is drainage by gravitation. A fluid collecting in an accessory cavity naturally seeks to follow the law of gravitation, and to collect in the lowest part of the cavity. It cannot flow out of the cavity until its level reaches the level of the natural opening, or until the position of the head is changed so as to bring the natural opening below the level of the fluid.

The opening of the antrum is situated near the upper part of its internal wall. Hence, secretions cannot flow

---

(1) Laryngoscope, July, 1908.

out of this orifice, in the upright position of the head, until the antrum is nearly full of fluid. The lower half of the antrum, however, is larger in volume than the anterior half, so that an accumulation of fluid, which is not high enough to reach the natural orifice in the upright position, may escape through this opening when the head is bent forwards. Complete emptying of the sinus can only take place when the head is bent toward the opposite side.

In the case of the frontal sinus, the opening is favorably situated when the individual is in the upright position, or when he lies upon the opposite side; but even when the naso-frontal duct is typical in arrangement, the drainage by gravitation is obstructed by the long and narrow passage through which the fluid must pass. This is equally true when the fluid must first pass through an ethmoid cell.

The anterior ethmoid cells open into the hiatus semilunaris, or between the bulla and the middle turbinate, each, according to Hajek, by a separate opening. This opening is sometimes situated near the floor of the cell, sometimes high above the level of the floor; but there are many deeper cells which open into each other and into the superficial cells in a variable manner, so that there is no position of the head in which the ethmoid labyrinth can completely empty itself. The posterior ethmoid cells are similarly situated, in reference to their outlet.

The opening of the sphenoid sinus is at the upper and outer part of its anterior wall, so that fluid can flow from this sinus only when the head is bent forward or toward the same side.

It is, therefore, evident that there is no single position of the head which is favorable to drainage from all the sinuses. During sleep, drainage from one-half of the sinuses would be favorably affected if the individual rest upon the side. During waking hours, in the occupation of most individuals, the position of the head varies sufficiently to cause frequent changes in the position of the fluid in the sinuses, and in this way the drainage of one or another of the sinuses may be temporarily affected in a favorable manner.

On the other hand, even when the head happens to be in such a position that the natural orifice of any particular sinus is at its most dependent portion, the escape of any contained secretion can, at best, be only slow and intermittent. For, when a liquid flows from a vessel with a narrow outlet, it escapes in jets. Each jet is followed by the entrance of a bubble of air into the vessel. If the surface tension of the liquid is low, the jets and bubbles follow each other in rapid succession; but if the liquid is thick and viscid, like glycerin, for instance, or like the nasal secretions, its escape will be very slow; in fact, if the opening is very small, there may be no escape of liquid at all.

Now, there is but one small opening into each sinus. Hence the escape of secretion from the sinuses is slow, each drop being succeeded by an intermission, during which a bubble of air enters the sinus. In persons who have excessive secretion in their sinuses, this bubble of air may give rise to a sensation, or to a noise of which the individual is distinctly conscious.

Considering these facts, and bearing in mind that the secretion of the healthy sinuses is a mucous fluid, and that of the diseased sinuses a still more viscid one, it is evident that gravitation, as such, plays a very small part in the drainage of the normal accessory sinuses, as well as in the drainage of those diseased cavities in which restoration to health takes place without operative interference. On the other hand, the explanation of the manner in which these cavities *are* drained, must be sought in a study of the character of the mucous membrane over which this drainage takes place, and of the physical properties of the secretion.

With the exception of the olfactory tract proper, the mucous membrane of the nose and its accessory cavities is covered with ciliated epithelium. The cilia are in a state of constant motion, which has been compared to the lashing of a whip. Each cilium moves through an arc of from 20 to 30 degrees, at the rate of about 12 times per second, the forward movement being about twice as rapid as the return movement. All the cilia of a single cell move in the same direction at the same time, but the cilia of all the cells do not move simultaneously, but the motion is carried over the mucous membrane in a wavelike manner. The movement of the cilia is maintained and governed by the nucleus of the cell. It is favored by heat, by a proper degree of fluidity, and by an alkaline reaction of the secretions; it is retarded by cold, by dryness, by viscidity of the secretions, and by various chemical reagents. The direction of the ciliary motion is always toward the external orifices of the body; in the accessory cavities it is toward their natural orifices. The power exerted by the combined action of the cilia is said to be very considerable.

By means of this ciliary motion, the secretion covering the mucous membrane is kept constantly moving toward the natural openings and into the nasal passages. Ciliary activity is therefore an important factor in maintaining the drainage of these cavities. The fact that diseases, in which the cilia are destroyed, such as the various forms of atrophic rhinitis, are frequently associated with accessory sinus diseases, would be an instance.

In some of the sinuses, and in favorable positions of the head, the activity of the cilia is in a downward direction, and is favored by gravitation; but in other sinuses, and in many positions of the head the fluid must be driven uphill, and in such cases the upward motion of the fluid is favored by the fact that the secretion is exuded from all parts of the mucous membrane in small quantities at a time. For some of the secretion is exuded near the natural orifice, so that the distance which it must be moved is small; but this fact also brings into play a certain law of physics, as follows: When a fluid is present in large quantities the law of gravitation prevails, and the fluid flows downwards; when the quantity of fluid is small, so small that it is measured in drops, its gravity may be counteracted or even overbalanced by other properties, such as adhesion, surface tension or tenacity, capillary attraction and siphonage.

In the nose the adhesion between the secretion and the surface of the mucous membrane is very great, for one of the main functions of the secretion is to keep the mucous membrane moist. Any secretion formed in the sinuses therefore tends to spread over the walls of the sinus. If secretion has accumulated within one of the sinuses, its surface will present a high meniscus, so that the level of the fluid where it comes in contact with the walls of the sinus will be much higher than in the middle, and the actual dimensions of the sinuses are such that the height of the meniscus is generally sufficient to bring the fluid up to the level of the natural orifice. In like manner the secretions rise out of the various depressions and pockets in the floor of the sinuses, and are able to surmount the obstructions presented by the partitions and septa which are often encountered. The rise of the meniscus is favored by the cilia; for the area of the mucous membrane is greatly increased by these numerous projections from its surface, and consequently the adhesion is greater. Moreover, as the direction of the ciliary motion is toward the natural orifice, the two forces always act in unison to bring the fluid to the outlet of the sinus.

If a liquid is contained within a tube the surface of which it can moisten, and whose diameter is sufficiently small, the adhesion of the liquid will overcome its gravity, and instead of flowing out of the tube, the liquid will rise in the tube contrary to the direction of gravitation. It is not necessary, however, that the capillary space be tubular in form; for these phenomena will manifest themselves equally well between any two surfaces which are near enough to each other. If the surfaces are parallel to each other, the liquid will rise to a certain height and its upper border will be horizontal. As the height to which the liquid will rise depends upon the distance between the surfaces, it follows that in a wedge-shaped space the liquid will rise higher along the narrow side of the wedge. In fact, in a horizontal wedge-shaped space which is open below, a drop of fluid introduced into the open part of the space below will flow upwards until it forms a narrow band along the line where the surfaces meet. Capillary attraction is always greatest in the immediate neighborhood of points of contact.

Now, as soon as the secretion of the sinuses reaches the natural outlet, it encounters the capillary attraction due to the conformation of the outlet. The outlet of the frontal sinus is tubular in form; in this form the capillary force is greatest, and it is by virtue of this fact that the resistance due to the unusual length of the naso-frontal duct is overcome. The orifices of the antrum and of the anterior ethmoid cells, as well as the naso-frontal duct, open into the semilunar hiatus, a narrow space with parallel walls, which exerts a not inconsiderable degree of capillary suction upon the secretion which presents itself in these orifices. The sphenoid sinus and the posterior ethmoid cells open into the very narrow superior meatus, whose walls are sufficiently close together to exert similar attraction upon their secretion.

When the semilunar hiatus is visible, the secretion may be seen; for it accumulates in the wedge-shaped space formed between the rounded edges of the lips of the hiatus. The secretion does not necessarily accumulate in the lower part of the hiatus, but flows readily along its entire length, quite independent of gravitation. By virtue of its adhesion and its power of spreading over the moist surface of the mucous membrane, it flows downwards over the uncinate process and upwards over the bulla, and will next be found accumulating in the wedge-shaped space or groove between the uncinate process and lower turbinal, or between the bulla and middle turbinal. In this way the secretion is spread over the entire surface of the middle meatus, and as this is the main respiratory channel, the secretion will, if its quantity is not excessive, disappear by evaporation. On the other hand, when the quantity of secretion is excessive, its further course is of interest. If the middle turbinal is large, the space between it and the outer nasal wall, and between it and the lower turbinal, becomes a capillary space. Owing to the rounded outline of the turbinals, this space is a wedge-shaped space, the angle of the wedge becoming more acute above. As the secretion must follow the law of capillary attraction and accumulate in the narrowest part of a wedge-shaped space, it will sometimes happen that the only visible accumulation of secretion will be found high up in the angle between the middle turbinal and the agger nasi. The fact that secretion is present in this locality, and that it reaccumulates here after it has been wiped away, does not indicate that it comes from the frontal sinus, for it may reach this locality from the antrum as well as from the frontal sinus. It is only when the space between the middle turbinal and the outer nasal wall is so large that capillary attraction between them is impossible, that the location of the secretion is of value in the differential diagnosis between the sinuses of the anterior group; for, under these circumstances, the secretion from the frontal sinus is apt to accumulate in the anterior part of the middle meatus, that from the antrum in the posterior part.

The secretion of the sphenoid sinus is apt to flow into the naso-pharynx; but it usually flows, together with the secretion from the posterior ethmoid cells, over the middle turbinal into the olfactory fissure. The mere presence of secretion in this region, however, is not pathognomonic of diseases of the posterior group of cells. For the secretion from the anterior group, which is drawn by capillary attraction to the outer surface of the middle turbinal, may accumulate along the edge of this structure in the form of a hanging drop or band. The secretion is not limited, however, to this hanging drop or band alone; for upon closer examination it can be seen that a thin film of secretion extends upwards on both sides of the turbinal, having been drawn up into this position by virtue of its wetting power, i. e., by adhesion. The thin film corresponds to the meniscus in a hollow space or cavity. If, now, the middle turbinal is in contact with the septum, or near enough to it to enable the drop of secretion to bridge the gap, the secretion will be readily drawn up into the angular space between the two structures, according to the law of capillarity which has been quoted. The presence of secretion in this region is, therefore, pathognomic only when disease of the anterior group has been excluded, or when the secretion can be seen in the superior meatus by posterior rhinoscopy.

The secretion which flows from the hiatus semilunaris over the uncinate process reaches the inner surface of the lower turbinal, and may accumulate along its lower border and reach the septum in the same manner as described above for the middle turbinal. From both turbinals the secretion of the entire nose is carried over to the septum, along which it can easily flow down to the nasal floor, to be discharged from the nose.

Between the two turbinals and the septum there is a triangular space, around the edges of which secretion is held by capillary attraction; but in many individuals this space is filled up by a slight elevation, thickening or spur of the septum, which converts this triangular space into a space with parallel walls, so that capillary attraction is equalized over this area. Such a slight elevation of the septum in this region may, therefore, be an aid to drainage, and its removal a distinct detriment.

It is evident from the above facts that the nasal passages may be regarded as a series of capillary spaces, which are in direct communication with the sinuses through the natural orifices, and that the secretion which lies in these capillary spaces is in direct continuity with the secretion which lies within the sinuses. It therefore follows that when the secretion which has entered the nasal passages through one of the natural openings, has reached as far down as the level of the fluid within the sinus, a new factor in drainage is called into play, namely, siphonage; for under these conditions the weight of the fluid within the sinus is balanced by the weight of the fluid in the nasal passages. As the capillarity of the nasal passages is exerted between the turbinals and the septum, its effects must be coextensive with these structures. Hence, as the area of the septum is very great, both in height and in length, especially in comparison with the corresponding dimensions of any one of the sinuses, the nasal passages must be considered as the long arm of the siphon, which has several short arms, each represented by one of the sinuses. The fact that the combined area of the sinuses is much greater than that of the septum and nasal passages does not enter into consideration at all; for siphonage depends upon the relative pressure in its two arms, and is independent of the number of vessels which may feed the siphon. When the amount of secretion is normal, the effect of siphonage upon each sinus is the same as if the other sinuses did not exist. When, on the other hand, the amount of secretion in one sinus is excessive, the increased volume of fluid may choke the long arm of the siphon, i. e., the nasal passages, and interfere with the flow from the other sinuses. The secretion may even back up into another short arm of the siphon,

i. e., into another sinus, and so we note the clinical fact that when one sinus is diseased the others are endangered. The position and shape of the natural orifices have no effect upon siphonage; for the natural orifice corresponds to the bend of the siphon, and it is quite immaterial whether it happens to be high or low, angular or rounded. Siphonage is independent of the position of the head; for the area of the septum is so great that it is equally effective in every position.

In order to maintain the efficiency of the siphon, it is necessary that the continuity of the fluid from within the sinus, through the natural orifice and into the nasal passage be unbroken. This continuity is favored by the tenacity of the secretion, which is supplied by its mucous constituents. A break in the continuity of the fluid, and a consequent interruption of the siphonage, may undoubtedly occur from various causes, but in the healthy nose such a break would be readily repaired by the activity of the cilia; for the direction of the ciliary movements corresponds exactly to the direction of the siphonage.

It has been supposed that ordinary quiet respiration aids the drainage of the sinuses by exerting a suction action during inspiration, the return of the fluid being prevented by a valve-like action of the semilunar hiatus. This theory would leave out of account entirely the posterior group of sinuses, as very little air passes through the superior meatus during quiet respiration.

It has also been supposed that expiration empties the sinuses in a way similar to the manner of emptying the middle ear by politzerization. That the ordinary movements of quiet respiration have no such effect may be proven by the observation that during quiet respiration a drop of mucus held in any of the capillary spaces of the nose executes only a very slight to and fro movement. On the other hand, forced expiration, as in sneezing and blowing the nose, and forced inspiration, as in the act called sniffling, act very powerfully to clear the nose of accumulated secretion, and by keeping the long arm of the siphon clear, aid in maintaining proper drainage. In like manner swallowing, gagging and gargling, by causing a reflex contraction of the superior constrictor of the pharynx, help to keep the posterior nares and nasopharynx clear of secretion.

The value of steam inhalations in acute accessory sinus disease has been known for a long time; their persistent and repeated use is also distinctly beneficial in the palliative treatment of those chronic affections which are associated with thickened secretion and crust formation. The writer calls especial attention to the hitherto unknown fact that such inhalations may be used for diagnostic purposes in a certain class of cases.

One of the most common symptoms of sinus disease is headache, which, in the chronic cases, takes the form of recurrent neuralgia. Such headaches are caused by a temporary occlusion of the natural orifice of the affected sinus, and can generally be quickly relieved by the use of steam. When, therefore, a patient with a recurrent headache of long standing, whether nasal symptoms, such as discharge, etc., be manifest or not, is subjected to the action of a steam inhalation as above described, if the headache be relieved, even though the relief be only partial or temporary, it can be definitely stated that the cause of the headache will be found in one of the accessory sinuses of the nose, or in the neighborhood of their natural orifices.

The fact that this procedure, which may be called a test for the nasal origin of headache, gives reliable information only when the result is positive, and that failure of the inhalation to relieve the headache does not necessarily exclude accessory sinus disease, does not invalidate the test; nor does the fact that it gives us no information as to which sinus is affected. The fact that the specialist has more accurate and more definite means of diagnosis renders it less useful to him than to the general practitioner, who is unprepared for, or unskilled in the more exact diagnosis of intranasal conditions. For the general practitioner this test constitutes a simple and harmless procedure, which will enable him to determine the cause of many a persistent headache which has long resisted his efforts at internal medication.

EMPYEMA.

H. Hempel[1] states that he has obtained some remarkable results in suppuration of the sinuses by the use *potassium iodid.* It is striking how well potassium iodid is borne in such cases unless there is an idiosyncracy against iodin. When patients are being treated with iodin it is notable that the secretion is watery and there is a great decrease of the swelling, especially of the turbinated bodies. Not only acute cases react favorably, but the same effect is exerted on chronic cases. While the remedy is not to be regarded as a cure-all and should be used in combination with other approved methods, not to the exclusion of surgical intervention, if it is absolutely necessary, a trial of it should be made in all cases before resorting to surgical measures.

Martens[2] uses a *suction apparatus* in the diagnosis and treatment of empyema of these cavities. He claims better results than with the rubber bulb instruments, which he thinks do not ordinarily have power enough. His instrument has a pump and a vacuum meter, so that the amount of suction may be determined. He uses a suction equal to 15 to 25 cm. of mercury. The apparatus is applied for from 3 to 5 minutes and pus is secured from cavities when no trace of it is seen in the nose before applying the suction. Brawley has done much work in the same line and claims satisfactory results.

Calculus in the Sphenoidal Sinus and Maxillary Antrum. A. von zur Muhlen[3] refers to the statement of Oppikofer, who reported 5 cases of calculus in the antrum of Higmore, that a well established case of formation of calculus in the sphenoidal sinus did not exist. The author states that he is in position to report such a case. After a suppuration of the frontal and ethmoid cells for which he operated, the patient returned with symptoms indicating some foreign body projecting into the nasal cavity and also the choana of one side was obstructed by a bulging of the sphenoidal sinus. The mass could not be removed

---

(1) Berlin. klin. Woch., Sept. 28, 1908.
(2) Deutsche med. Woch., Jan. 18, 1909.
(3) Archiv f. Laryngol. u. Rhinol. B. 21, H. 2.

intranasally and operation externally was necessary. A calculus was removed which measured 3.9 by 3.5 cm. (1.5 by 1.36 in.) and weighed 25.5 gm. ($\frac{5}{6}$ oz.). The calculus consisted of two parts united by a somewhat smaller neck. The larger part had lain in the maxillary and the smaller in the sphenoidal sinus.

THE ANTRUM.

Empyema. T. W. Moore[1] reports a number of cases of *empyema* of the antrum cured by simple puncture in the inferior meatus and washing out with normal salt solution. In some of these cases the disease had been present for years and the author makes a plea for greater conservatism in the treatment of the antrum. While many cases will undoubtedly require a radical operation, a far larger number of even chronic cases will yield to simple washing through a small opening. Moore washes the cavity daily until the solution is free from pus, then every other day for 2 or 3 times and then after 1 week. If pus is no longer present the patient is dismissed as cured.

H. Tilley,[2] probably the best English authority on the adnasal cavities, discussed the subject of antral disease in relation to special and general surgery before the British Medical Association at its 1908 meeting. Of acute antral suppuration he says when antral suppuration is obviously of dental origin the offending tooth should be removed and free communication with the antrum made through the alveolus by means of a suitable perforator. The sinus should be gently irrigated with a warm sterile normal saline solution, boracic lotion, weak Condy's fluid, or with any one of the numerous mild fragrant antiseptics which are now on the market. The alveolar openings should be kept open by a suitable plug, and irrigation practised twice or thrice daily at first, and at increasing intervals as the amount of pus observed in the returning fluid becomes less. When, after an interval of five to seven days, no pus is seen in the basin after irrigation, the plug may be finally removed overnight, and by the morning the alveolar perfora-

---

(1) Laryngoscope, April, 1908.
(2) British Med. Jour., Aug. 22, 1908.

tion will be nearly closed. When antral suppuration is of nasal origin the prognosis is less favorable, and the treatment may be less simple, for reasons which will be discussed immediately. Under these circumstances we must endeavor:

1. To treat the primary constitutional disease by rest in bed, suitable food and such internal medication as the nature of the general infection may indicate.

2. To allay the local discomfort caused by the complicating acute sinuitis. The neuralgic pain will frequently be relieved by 10-grain doses of aspirin every four or six hours, and hot fomentations to the cheek may assist to the same end.

3. But locally our chief efforts must be directed to promoting the free and spontaneous discharge of pus from the antrum by way of the natural ostium, and these ends may be attained—

(*a*) By directing the patient to lie in bed with the diseased antrum uppermost.

(*b*) The application of cocain and adrenalin solutions to the regions around the middle meatus. This may be done every four or six hours.

(*c*) Scarification of these regions is recommended by Lack, and experience confirms the efficacy of the method.

(*d*) In the intervals of such treatment inhalation of mentholized steam will have a similar effect in inducing contraction of the swollen intranasal mucosa.

If these means fail the antrum should be punctured through its inner wall in the inferior meatus and irrigated with warm, mild antiseptic lotions. If this be done daily or on alternate days for five or six times, resolution will generally take place. Should suppuration continue, then a larger intranasal opening must be made, and this will practically always succeed in curing acute antral suppuration for which milder measures have failed.

In regard to chronic antral empyema he believes that intranasal drainage by one or other route is the most satisfactory method.

(*a*) Because free drainage into the nose is established and this is continuous and permanent, and it involves no trouble to the patient beyond irrigation with some mild antiseptic for a few weeks after the operation. Contamination from the mouth is also prevented, and the sacrifice of a useful, though possibly not a sound, tooth will not be called for.

(*b*) From the patient's point of view, there are no painful after-dressings, and neuralgic pain, so frequent after alveolar puncture (so that the patient often dreads the use of the syringe), is almost unknown with the more radical procedures.

(*c*) Convalescence from the more radical Caldwell-Luc operation is rapid, the patient is rarely detained indoors beyond five to seven days. The simple intranasal operation is often done in the out-patient department of hospitals, and the patient goes home a few hours later.

With regard to the treatment of chronic antral empyemata by means of vaccines, or by treatment based upon the opsonic index, he has not had a large experience, and the few patients who were thus treated did not give satisfactory results, although the treatment was carried out by experts.

It seemed that their chief difficulty lay in the fact that a variety of organisms were present in each case.

It would be interesting to know from those who have had much experience of this form of treatment whether it is satisfactory as a practical method, the length of time usually required, and finally, whether such a treatment might be useful in cases which prove obstinate by surgical methods already described.

He concludes: "It will thus be obvious to you that apart from acute cases of obviously dental origin, where alveolar drainage may be adopted with every hope of success, I am pleading today for the more frequent adoption of the intranasal drainage, a method which has more advantages than, and none of the drawbacks of, the alveolar method, while its employment is in complete accord with those general principles of surgery which should guide us whenever we endeavor to cure chronic suppuration of a bony-walled cavity."

Angioma. E. F. Reamer[1] reports a case of this rare

---

(1) Jour. Minn. State Med. Assoc. and N. W. Lancet, March 1, 1909.

condition. Radical operation through the anterior wall of the antrum was done, the deep antral cavity being found entirely filled with blood and blood vessels. The cavity was cleaned out with a dull curette and the finger, rapid work being necessary on account of severe hemorrhage. A tight gauze packing was used, the pressure being gradually lessened in repacking. Complete cure was secured.

THE FRONTAL SINUS.

Anomalies M. Cohen[1] describes a specimen recently seen by him in which there were two distinct frontal sinuses on each side of the frontal septum, each with a distinct nasofrontal duct. The difficulties which would be encountered in frontal sinus empyema in such a subject would be more easily imagined than overcome in the diagnosis and treatment. The author has also recently seen skulls in which there were respectively, no frontal sinuses, only one frontal sinus, and three frontal sinuses.

Nonsuppurative Inflammation. F. Brawley[2] believes that the *headache of nonsuppurative frontal sinuitis* is a distinct clinical entity admitting of accurate demonstration. In such a case the region of the middle turbinate is usually found normal except that the turbinate is in closer approximation to the lateral nasal wall than usual. This condition causes a blocking of the frontonasal duct upon slight turgescence of the turbinate, so that there is a history of unilateral pain coming on in damp, chilly weather, with colds, at the menstrual period, etc.; in short, whenever nasal congestion occurs.

With the duct blocked no air can enter to replace the oxygen which is rapidly absorbed by the sinus membrane. A vacuum results with consequent swelling of the lining membrane and irritation of the fibers of the anterior nasal nerve, producing a headache in this region. During such a headache relief may generally be secured by application of a solution of adrenalin or cocain to the middle turbinate, thus opening up the frontonasal duct. If the patient cannot be seen during an attack, Brawley states

---

(1) Jour. Am. Med. Assoc., June 6, 1908.
(2) Laryngoscope, September, 1908.

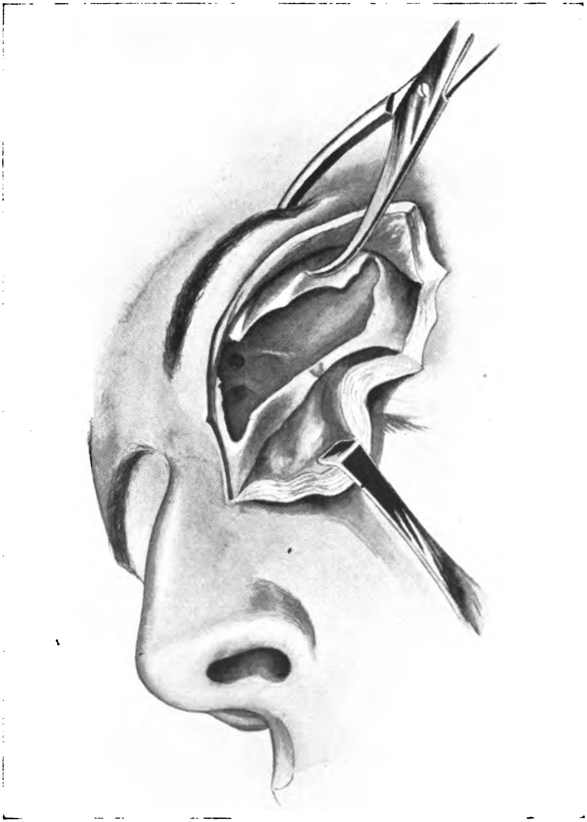


PLATE II.

Jansen's Operation (Page 287).

that the headache may be artificially produced by suction with a suction pump on the affected side.

When the etiology is definitely established, removal of the anterior third of the middle turbinate is indicated. The author describes a case in detail illustrative of the disease in question.

Operative Treatment. Operations on the frontal sinus have received much attention in the literature of the year. A. Jansen, of Berlin, who has done 800 radical operations on the sinus, was a visitor to America during the year and gave a number of addresses on the operation. While nearly all frontal sinus empyemas are curable by simple drainage and irrigation, yet there are cases which nothing can cure save the most radical operation. Jansen[1] does a modified Killian operation in most cases. Fig. 19 shows the technic of the complete operation. He employs the different methods of operation according to the following indications:

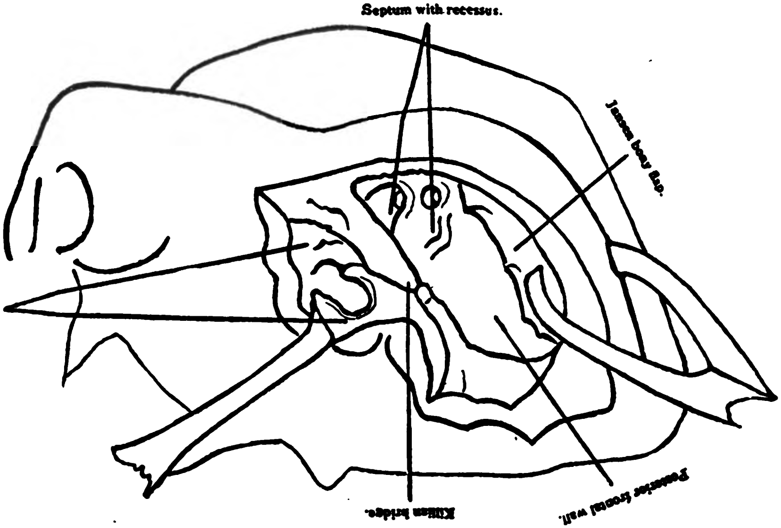


Fig. 19. Interpretation of Jansen's operation. See plate.

---

(1) Laryngoscope, November, 1908.

"I. With young children and adults having a very small frontal sinus, no plastic procedure being necessary, I remove the anterior and inferior wall, including the supra-orbital margin; a procedure for a great many years practiced by me; my old operation.

"II. With older children or adults, having somewhat larger cavities, I perform the operation by forming the anterior bony flap, according to my procedure practiced for several years.

"III. Should the cavities be still larger (though in any case small), I form the Killian bridge, removing the anterior and inferior wall and, if necessary, filling the cavity with a piece of paraffin.

"IV. Should the cavities be rather extended, I form both the anterior bony flap and the Killian bridge. This is my standard operation since 1904.

"V. I form two bony flaps, the anterior and the marginal, if primary closure is impossible, as well as a solid bridge; for instance, in endocranial abscess, or in phlegmon, or if the operation must be performed as rapidly as possible (in weakness of the heart, etc.). The same method is indicated if the operator's experience should be insufficient to overcome the difficulties accompanying, in extraordinary anatomical conditions, the formation of the Killian bridge."

R. H. Skillern[1] in discussing the *endonasal operations for frontal sinuitis* reaches the following conclusions:

Endonasal frontal operation indicated in:

(1) All cases of acute empyema with urgent symptoms where the usual conservative methods have been tried, with no relief to the patient. (Ingals' operation.)

(2) Acute cases where removal of anterior end of middle turbinate and washing out does not appear to be affecting a cure. (Ingals' operation.)

(3) Cases of chronic empyema where a small sinus is present. (Halle operation. A more radical operation than Ingals'.)

(4) Cases of chronic empyema regardless of the size of the sinus where one has reason to believe no great

---

(1) Laryngoscope, June, 1908.

pathologic changes have taken place in the mucous membrane. (Halle operation.)

(5) In any case where for cosmetic reasons it is necessary to give the patient the benefit of the doubt.

Endonasal frontal operation contraindicated:

(1) When it is not possible to pass a sound into the sinus.

(2) In abscess and fistula formations.

(3) When intracranïal complications are suspected.

Endonasal frontal operation will probably be unavailing where:

(1) Great pathologic changes have taken place in the mucous membrane of the sinus.

(2) Numerous ramifications and partial septa are present in the sinus.

(3) Large pushed forward (orbital) ethmoid cells are present which are likewise diseased.

M. Hajek[1] remarks that there is general agreement as to the *lack of indication for operative interference* in most cases of acute inflammation of the frontal sinus unless the bone is diseased or a cerebral complication is threatening. If general and intranasal treatment does not suffice the middle turbinated body should be resected so as to give free exit to the pus and eventually a simple trephining of the sinus may be necessary. In the chronic inflammations the cases complicated with bony disease may be at once excluded as demanding operations. A small group of cases in which in from 1 to 4 weeks after intranasal treatment a cure is secured. In these cases operation is not indicated. In a larger number of cases the headache and pressure symptoms are relieved, but the discharge continues. In others neither of the symptoms is relieved by intranasal treatment. In the latter classes of cases the question arises, When should the radical operation be undertaken? Hajek believes that many surgeons are inclined to be too hasty in deciding in favor of this procedure. The dangers which accompany it should always be borne in mind. It is probably better to delay operation for some weeks to make sure that no benefit is being received from intranasal treatment. If this is really

---

(1) Wien. med. Woch., June 27, 1908.

the case the question will arise how long may one wait before proceeding to radical measures. This cannot be decided by any rule but must be determined according to the circumstances of the individual case. In some cases the condition of the patient is very tolerable unless an acute attack comes on which may necessitate operation. Others will show such urgent symptoms as to impel the surgeon to early interference. Some cases may live in comparative comfort for a year or more. In conclusion the author emphasizes the fact that operation on the frontal sinus is not devoid of danger and all practicable nonoperative methods should be tried before running the risk of such a procedure.

J. C. Beck[1] describes an operation done by him in which after outlining the sinus by means of the x-ray he raised a bony flap comprising the entire anterior wall by means of a chain saw. After clearing out debris and enlarging the nasofrontal duct, the bone flap, which hung by a periosteal hinge at the lower border, was replaced and healing occurred without deformity. The operation is possible only where both sinuses are diseased and where it is not necessary to remove the mucous lining. It cannot take the place of the radical Killian operation for badly diseased sinuses.

NASAL TUBERCULOSIS.

E. Gerst[2] remarks that the frequency with which one will recognize tuberculosis in the nose will be much increased if the incorrect assumption that its clinical forms are divided strictly into two classes, the tumor forming and the ulcerative, is got rid of. It must also be recognized that other parts of the nasal mucous membrane besides that covering the septum are frequently attacked by the disease. He refers to the observations of Pasch who found that often the mucous membrane undergoes a tuberculous infiltration which slowly progresses and in places may lead to the formation of tumors, while in

---

(1) Jour. Am. Med. Assoc., Aug. 8, 1908.
(2) Archiv. f. Laryngologie u. Rhinologie B. 21, H. 2, 1908.

others a latent condition sets in so that when the tumor mass is removed there remains a part of the infiltrated mucosa which pursues its slow development with the production of more distinctive tuberculous lesions at a later period. The frequency of these latent foci explains sufficiently the lack of permanence in the treatment of tuberculosis of the nose which is frequently observed. Theoretically it seems desirable in removing a tuberculous tumor to do so with as great a sparing of the tissue surrounding it as possible, removing only the distinct lesions and avoiding wounding the healthy mucous membrane as much as possible in order to avoid infecting new areas of the mucosa with the disease. In cases in which there is only a single distinct tumor, which is relatively rare, this procedure is a correct one although the fear of injuring the sound mucous membrane is, in consideration of the usual method in which the infection spreads, not entirely justified for the most part permanent or at least more lasting results are likely to be achieved by the curette which is likely to remove the latent foci while respecting the healthy tissues. At any rate the author's latest experience confirms the conclusions of Pasch that the principal factor in the production of relapses is not so much the leaving of tuberculous tissue in the deeper parts of single foci operated on, but the overlooking of latent foci. It is as difficult to judge of the fact of healing from the clinical symptoms as it is to determine the extent of the tuberculous infiltration. By practically every active method a condition is reached in which there is so favorable an appearance that one is likely to think that a cure has been achieved. If a piece of tissue from such a healed nose is removed and examined, much surprise will be occasioned by finding tuberculosis still present in the healthy appearing tissue. The relatively great benignity of nasal tuberculosis and the slow development of the complications which arise from it must be our consolation for the inefficiency of the methods which often result in improvement, but seldom in recovery, far more rarely than purely clinical examinations would lead us to suppose.

EPISTAXIS.

J. W. Barrett[1] reports two cases of epistaxis in which ligation of the external carotid was necessary in order to check the hemorrhage. In the first case the bleeding from the nose began four days after an operation under chloroform anesthesia for nasal polypus. Tamponage was temporarily successful, but on removing the tampon the bleeding recommenced and after many fruitless attempts to check it in this way ligation of the carotid was resorted to with final success. In the second case the bleeding occurred after cauterization of the nose and continued until ligation became necessary. There was no hemophilia in either case.

NASAL REFLEXES.

According to L. Rethi[2] the *reflex causation of disease from the nose* is not recognized so commonly as it was formerly and when a causal connection between affections of the nose and those of other organs is established it is not always to be explained on the principle of reflex action. The changes in the circulation or in other relations may account for many cases. Nevertheless reflex action must be admitted in certain cases and in some cases although the condition of the nose is not the cause of the disease it may aggravate it by reflex action. In most cases a visible alteration in the nose can be made out, but in others this is not the case. The author reports a case in which the nose appeared normal and yet was the occasion of the persistence of a dry cough for years in spite of all medication. Another case showed that the nose was the causative factor in an ache between the shoulders that had been attributed to rheumatism, but had not improved under any form of rheumatic remedy. Cauterization of an apparently healthy portion of the end of the middle turbinated body put an end to the backache. In cases where such a reflex is supposed to

---

(1) Intercolonial Med. Jour. of Australia, June, 1908. Abs. in Int. Centralbl. f. Laryngol., Rhinol., etc., Jan. 10, 1909.
(2) Wiener. med. Woch., Jan. 23, 1909.

be the cause of the condition the structures of the nose should be gone over carefully to find any point which may show an influence on the disease. When this is found treatment may put an end to symptoms of long standing which have resisted other forms of treatment.

Kanasugi[1] (Tokio) describes a case of *tic douloureux* which came into his hands in Vienna for nasal examination, the patient expecting to have a neurectomy of the second branch of the trigeminus on the following day in Alberts' service. Although the nasal conditions were quite normal Kanasugi used the electrocautery experimentally on the middle turbinal of the affected side. The *tic douloureux* was so completely relieved that after waiting for a few days the patient departed for home without having a neurectomy done. Five years later the cure remained perfect. The author has since used this treatment in a number of similar cases and always with relief of the pain, sometimes for a short period only, but at others with long continued relief.

A. Kuttner[2] discusses the theory of *nasal dysmenorrhea* as proposed by Fliess and his followers. While he recognizes the existence of cases in which irritation of the nose will induce pain in the genital region or increase the pain of a dysmenorrhea and also cases in which the application of cocain or other anesthetic will diminish the pain or in some cases cure the disease, these successes are in his opinion the result of psychic influences consciously or unconsciously exerted by the physician and succeed only in a limited number of cases. They afford no ground in his opinion for assuming a physiologic connection between the nose and the genital organs such that in every female menstruation and other changes in the sexual functions are accompanied by corresponding changes in the nose and that certain parts of the nasal mucous membrane contain tissues related to specific parts of the genital apparatus. The latter assumption is discredited by the fact that some observers have found relations which others failed to find indicating that no regular reflex obtains between the parts supposed to be specificially related.

---

(1) Wiener med. Woch., Jan. 23, 1909.
(2) Deutsche med. Woch., June 11, 1908.

Koblanck[1] reviews the work of W. Hack, Fliess, Kuttner, and others and gives his own observations regarding the connection between the *nose and the genital organs.* He calls attention to the fact that the genital tract in the nose is more extensive in many cases than that pointed out by Fliess, viz.: The tubercle and the anterior end of the inferior turbinated body. In obstetric work he finds that two different effects can be secured by different technic. If the parts be pencilled with cocain pain will be relieved, most promptly and effectually if the application is made about the middle of the first stage and if the pains are due to muscular contractions and not to pressure. If the tubercle be rubbed firmly with a smooth glass rod the uterin contractions will be stimulated. The gynecologic applications are more numerous. Dysmenorrhea can be relieved by cautery of this region while some cases of amenorrhea which in the author's opinion depend on onanism are cured by reducing the swelling in the nose by which the abnormal tendency is reduced and the vicious habit given up. In a similar way be has been able to reduce abnormal sexual irritability in men. Sterility may also sometimes be removed.

NASAL TUMORS.

Cancer. E. M. Holmes[2] reports operations on eleven cases of cancer of the nose. Of these, two were attached to the septum, three to the middle turbinate, one to the anterior end of the inferior turbinate, three originated in the antrum of Highmore, while two were so extensive when examined as to render their origin uncertain. The ages ranged from 17 years to 70 years.

The septal cases were carcinoma and were seen early enough to admit of complete removal through healthy tissue. One of these remained well 12 years afterward while the other, a woman, had had no recurrence when death occurred from carcinoma of the uterus 18 months later.

---

(1) Deutsche med. Woch., June 11, 1908.
(2) Laryngoscope, September, 1908.

One of the middle turbinate cases, in a man aged 72, had not recurred 10 years after operation. All of the other patients were only temporarily relieved dying from recurrence in a few weeks or months except one who died a few hours after operation.

The author remarks how rapidly these nasal growths, whether carcinoma, sarcoma, or endothelioma may progress, how they push into and fill the labyrinth of sponge-like cells of the ethmoid and the sphenoid, how liable they are to break down the base and enter the floor of the cranial cavity, and how extensive they are liable to be when first seen by a physician. In looking over his records he was surprised to find how frequently growths in the nose which he feared might be malignant from the general appearance were reported to be benign by the pathologist.

THE NASOPHARYNX.

Pharyngeal Inflammation and Neurasthenia. Royet[1] thinks that a large number of cases of neurasthenia can be traced to inflammation of the fossa of Rosenmüller and the adjacent parts of the pharynx and that an effective therapy must be based on a recognition of the dependence of the nervous symptoms on the local inflammation. He calls attention to the important anatomic relations of the lateral part of the nasopharynx. In scarcely any other part of the body can so many important structures be found grouped in so small a space and in close relation to a mucous membrane liable to constant irritation and chronic inflammation. In close proximity are the Eustachian tube, the carotid artery and the jugular vein, the pneumogastric nerve, the sympathetic nerve, the glossopharyngeal, hypoglossal and spinal accessory, and not far away are the cervical lymph glands, the parotid gland and the facial nerve. In addition there are the extensions of the mucous membrane. The fossa of Rosenmüller is so arranged that if inflamed its mucous membrane is likely to swell and form a pouch closed at the

---

(1) Archives internat. de laryngol., otol., etc., January-February, 1909.

bottom in which normal and pathologic secretions will accumulate. The swelling of the mucous membrane if chronic is likely to bring the two folds of mucous membrane together in such a way that they become adherent and form a closed sac which may retain for a considerable time the products of inflammation. This accumulation of pus may affect the neighboring parts of the pharyngeal mucosa and the adjacent nerves and lymphatics. The depth of the fossa of Rosenmüller is very variable in different subjects. Not only does the stagnation of pus in this cul-de-sac cause a constant chronic irritation of neighboring parts, but it is the source of numerous relapses and of aggravation of infections that would be otherwise slight and transient. Royet enumerates the following symptoms which may result from inflammation in this neighborhood.

Symptoms resulting from the affection of the nasopharynx itself.—Headache, mental dullness and inattention, asthmatic attacks, nasal hydrorrhea, collections of mucus in the pharynx, nervous cough. Symptoms referable to the ear:—Subjective noises, deafness, sensitiveness to noise, vertigo and loss of equilibrium, fear of open spaces, anxiety, myasthenia (the author attributes this to the vertigo) sense of pressure on the head, sensation of emptiness in the head.

Symptoms referable to the tissues adjacent to the pharynx.—Interference with circulation by pressure on the carotid or the jugular is a possible result, but Royet thinks that such changes could be explained by the action on the cervical ganglion under the control of which is the circulation to the nerve centers. By action on the nerves inflammation in the lateral part of the nasopharynx may cause, according to the author, insomnia, tachycardia, palpitation, intermittent pulse, emotional outbreaks the result of the irregularity of the heart, sensation of anxious expectation often felt between the emotional paroxysms, digestive troubles, neuralgia, motor and sensory neuroses of the pharynx, etc.

Not only does an affection of the lateral part of the usually referred to neurasthenia, but it explains also their nasopharynx explain the greater part of the symptoms variable character. The patient who is too weak to walk will under excitement perform tasks requiring considerable muscular strength. The sudden disappearance of the nervous symptoms is also easily understood.

The only means to discover this affection is by touch. It is not difficult but it requires some practice. It is the means of diagnosis par excellence and puts one in position to execute at once and with little more inconvenience to the patient a remedial measure of the first importance, viz., the rupture of the adhesions that may have formed. Several signs should excite suspicion of these lesions: lateral pharyngitis, a granular condition of the pharynx, the symmetrical contraction of the velum palati, pain on pressure in the retro-maxillary region, previous or present recurrent attacks of pharyngitis, cervical adenitis, in general all the symptoms referable to the ear, etc.

Nasopharyngitis in Children A Hecht[1] calls attention to catarrh of the nasopharynx as a cause of intractable cough as well as the source of infection of the middle ear, the larynx, bronchi, and even the lungs. The secretion from the nose and pharynx in infectious diseases run down the back wall of the pharynx especially when the child lies on its back in sleep, comes in contact with the larynx and sets up the tendency to cough. This cough has peculiar characters: It is spasmodic, sometimes croupy, and inclines to produce vomiting. Such an affection of the nasopharynx is especially liable to accompany measles and produces the distressing cough of this disease. For the treatment of this condition the author recommends the instillation into the nose of a few drops of a 0.5 per cent. solution of sozoiodolate of zinc at first every three hours and later three times a day. In one case which he reports in which the child was kept awake by the cough he slept the entire night after the first instillation. In another case the cough was relieved, but returned again when the applications were suspended for twenty-four hours. The method gives good results in the relief of symptoms even when on account of complications the outcome of the case is unfavorable. It may by lessen-

---

(1) Therap. Monatshefte, August, 1908.

ing restlessness and promoting sleep, save the strength and secure a life-saving advantage in critical cases.

PHARYNGEAL TONSIL.

Streptococcus Infection of the Pharyngeal Tonsil. Alice G. Bryant[1] calls attention to the occurrence of streptococcic infection of the pharyngeal tonsil in adults and reports three typical cases. The patients presented symptoms of mild septic fever with no ascertainable source of infection until a post-nasal examination was made when the pharyngeal tonsil was discovered to be inflamed and covered with secretion. Treatment directed to cleansing the nasopharynx soon restored the patient to normal health. Almost every practitioner has had cases both in children and adults in which the fever and other symptoms continued unabated until cleansing treatment of the nasopharynx was resorted to.

Primary Diphtheria of the Pharyngeal Tonsil. F. C. Giresse[2] finds that the pharyngeal tonsil is one of the most frequent primary seats of diphtheria, often passing unperceived and forming the starting point of a pharyngeal or croupal affection which is mistakenly supposed to be the primary disorder. The symptoms are very obscure and little characteristic, the more so as it frequently develops in children who are already the subjects of adenoids. The diagnosis can be made by observing the combination of the signs of adenoids and a profound general intoxication which will furnish the indications for a bacterial examination. The prognosis of this affection is very grave because the difficulty of diagnosis usually precludes its discovery in its early stage and it is generally discovered only when the general intoxication has become very pronounced. Preventive treatment consists in removal of the adenoid tissues after a bacteriologic examination so as to avoid any inoculation of the tissues. In case the disease is already established curative treatment consists in early, intense, and prolonged application of serum therapy.

---

(1) Jour. Am. Med. Assoc., June 13, 1908.
(2) These de Bordeaux, 1907.

Adenectomy. L. Neufeld[1] has had three cases of *torticollis following adenectomy.* There was a slight elevation of temperature in all three cases lasting about a week. The torticollis appeared on the second, third and fifth days respectively. There was swelling and soreness of the glands of the neck. Recovery took place in from two weeks to two months.

THE PHARYNX.

Gangrene of the Pharynx. Citelli[2] reports three cases of primary gangrene of the pharynx two of which resulted fatally, but the third recovered under the use of anti-streptococcic serum. Primary gangrene is, in his experience, very rare, these being the only cases which he has seen, although secondary conditions are common. The etiology is obscure and the bacterial cause is probably different in different cases, although Citelli believes that a large number of such cases must be due to the streptococcus. There is not usually much fever, but a great deal of depression, rapid pulse and slight albuminuria. These symptoms are due to the absorption of septic products. Death usually supervenes in one or two weeks from sepsis or sometimes from septicemia. The principal symptoms are the fetid breath, nasal voice and regurgitation of liquids through the nose in consequence of paresis. Serious hemorrhage may result from incautiously removing the slough.

The diagnosis may be easy, but if diphtheria is also present it may be doubtful. In such cases if the necrotic tissues become more prominent and the condition gets no better or becomes worse under the administration of antitoxin, gangrene should be suspected.

The treatment consists in local disinfection and tonic general treatment. Diphtheria antitoxin should not be administered after the diagnosis has been made as it may be dangerous. Antistreptococcic serum should be given in cases which seem to be due to the streptococcus.

---

(1) Arch. f. Laryngol. u. Rhinol., B. 20, H. 3.
(2) Archives Internat. de laryngol., otol., etc., January-February, 1909.

THE MOUTH.

Tuberculosis. The subject of tubercular ulceration of the mouth and oropharynx is one of much interest and importance to the general practitioner as well as the specialist. Unless the symptoms of pulmonary or general tuberculosis are quite evident such cases are nearly always diagnosed as syphilis and receive treatment for that disease with the natural result that the patient is injured instead of benefited. Every one recognizes theoretically the difference between the mouse-eaten ulcer of tuberculosis and the clear-cut edges of the syphilitic ulcer, yet when brought face to face with an ulcer of the former character in the mouth, nearly always the observer thinks of syphilis and syphilis only. Primary tuberculosis of the upper air tract is very rare and its occurrence disputed by some investigators. Whether it does occur as a primary focus is of much less importance to the physician—and to the patient—than the recognition of the *fact* that tubercular ulceration of the nose, pharynx, larynx or mouth may and not infrequently does occur in patients in whom signs and symptoms of pulmonary tuberculosis are either undiscoverable or discoverable only by the most painstaking examination. More attention to the *fact* and less concern about the *disputed point* by the man to whom the patient looks for relief would clear the atmosphere considerably for the former and be of vital benefit to the latter. A case of tubercular ulceration of the mouth in which treatment for syphilis had been given by various physicians and dentists for months without benefit to the patient has recently come to the editor's attention. The diagnosis was finally made by a general practitioner but too late to be of much value to the patient.

E. A. Willis[1] reports two cases of what he believed to be primary tuberculosis of the uvula and goes into the literature of the subject very completely, quoting reports of supposedly primary tuberculosis of the upper air tract from many observers. He concludes:

"Primary tuberculosis of the upper respiratory and

---

(1) Laryngoscope, August, 1908.

alimentary tracts is not such a common condition that we can generalize or draw many conclusions from the relatively small number of cases reported, and the few that we may meet in our own personal experience. We can not help but note that many of the presumably primary infections are at some time later disproved by indications of previous or concomitant general infection, or local infection which must have been overlooked at the time of earlier examination, on account of its presence being undemonstrable. The concensus of opinion is that these infections appearing in the upper respiratory and alimentary tracts, whether primary or secondary, are very severe, and run their course in a short space of time, but that if seen and treated early in their course the chances for cure are good."

Palate Pemphigus. While pemphigus involving the throat is not a common trouble such cases are reported at intervals in the literature. If seen after the blisters break they are almost certain to be mistaken for mucous patches and treated accordingly. L. M. Hurd[1] reports a case in a woman. Harmon Smith in discussing the subject stated that the diagnosis depended largely on the pain present if the blisters were broken when first seen, as mucous patches are not painful as a rule. When there is pemphigus of the throat the gastrointestinal tract is very likely to be involved with great pain accompanying the extension of the disease. The probable outcome of such a case is death from the gastrointestinal involvement.

Epithelioma. A case of epithelioma of the palate in a boy of sixteen years was exhibited by J. W. Bond[2] before the London Laryngological Society. The unusual age of the patient makes the case worthy of record.

THE TONSILS.

Evolution and the Tonsil The tonsil has occupied a considerable place in the literature of the year. As noted last year, radical removal is the operation generally done

---

(1) Laryngoscope, April, 1908.
(2) London Jour. of Laryngol., Rhinol. and Otol., January, 1909.

and the new instruments presented are all for use in enucleation. The function of the tonsillar tissue is as much of a mystery as ever and about as much space as usual has been given to conjectures as to its use in the economy.

A scholarly article on the tonsil from an evolutionary point of view is presented by Jonathan Wright.[1] He thinks there is something significant in the enlargement of the tonsils in civilized children in response to the sudden changes of temperature from overheated houses to the excessive cold of out-of-doors. As Wright says,

"The modern hyperborean man as he leaves his dwelling suffers in winter a drop of some 70 or 80 degrees in the temperature of the surrounding atmosphere and of the inhaled air. Millions of the human race are thus living and adapting themselves racially to conditions hitherto foreign to their environment and foreign today to the environment of barbarous races and of those living in tropical or subtropical countries. In the systems of these large numbers of the race a call is being made upon vasomotor and cellular activities, which we know from what biology is teaching us must meet with some response and with some ontogenetic or phylogenetic adaptation which will allow the organism to respond. Not only is the high equable temperature for many hours a new experience, but in all probability the sudden change through the wide range of the thermometric scale is still further influential in biologic effect. The sensible response to this is frequent, whatever response there may be of which our sensibility fails to take note. That response is usually a congestion and often an inflammation resulting in the hypertrophy of the lymphoid tissue of the pharynx.

"Does natural selection or ontogenetic adaptation seize upon this response as an opportunity for the evolution of an organ to protect the young child from air or food borne infection?

"Beyond the sporadic experience with the sand of the desert man has only recently been subjected to the modern city dust. It is true he has been subjected, in the swinish overcrowding of former civilizations, to bacterial infection

---

(1) N. Y. Med. Jour., Aug. 8, 1909.

carried from his fellow man by other means than the dust. The result of this—the repeated scourging of mankind by plagues—has brought about, by means of natural selection alone, it is urged, a resistance to such infection not possessed by savage races who have had no such racial experience. Now it must be borne in mind, if we recognize in this phenomenon of racial susceptibility a lower opsonic index or a lower bacteriolytic power in the serum, we must logically find some significance in the fact noted by many observers that these races, black and red, and modern man in the tropics have a markedly lower proportion of children with large tonsils.

"Here, then, we may note a coincidence which may be significant between the tendency to enlargement of the tonsils and the natural immunity of civilized man to many infectious diseases."

The author notes that in certain starfishes which occasionally have one of their parts infected by a parasite, a process of "autotomie" is set up whereby the affected part is self amputated. This part being, however, a necessary and integral part of the organism, is subsequently regenerated. He finds in the well recognized tendency to recurrence of the tonsillar hypertrophy in very young children in whom partial removal has been done a striking similarity to the regenerative activity of the starfish, just mentioned. He thinks it is "difficult to look upon this performance of the human organism in any other light than we look upon the performance of the starfish's restitution after 'autotomie.' They need them."

He says in conclusion:

"In what I have written here I do not wish to be misunderstood. I do not wish positively to assert that the enlargements of the tonsils are always a protective physiological act of the organism. Neither do I wish to deny they are frequently, or even usually in adolescence, solely a menace when diseased. I simply have endeavored to gather some evidence from the fields of pathology and of clinical observation as well as from the broader field of general biology, suggestive of a place their enlargement possibly may occupy among the phenomena of organic evolution. Nevertheless, whatever may be the conclusions as to their marked enlargement, the knowledge derived from all these sources and the experimental evidence, which I have elsewhere adduced, unite in pointing to the function of the tonsils as one of defense against infection. The tendency to enlargement seems a persistence of the process by which the function was evolved."

[It seems to the editor that too much stress is laid on the evolutionary idea in dealing with modern civilized man. Nature takes a long time (we are accustomed to saying *ages*) to produce evolutionary changes and eliminate those individuals which according to her standards are unfit to survive. Nature cares nothing for the individual, little even for the race, in her merciless selection and elimination. A true evolutionist might well infer from what he sees of Nature's treatment of civilized man that the ruthless mother has determined that the artificial existence of modern civilized man renders him unfit to survive in her great plan and she is using every possible means to eliminate the civilized part of the race or at least to trim down to a very few hardly individuals of a new type capable of existing under civilized conditions. When we see what Nature is doing by means of the appendix vermiformis, the three tonsils, cancer, nervous diseases et cetera it is hard to believe that she is not using every possible means to eliminate a large share of civilized beings from her scheme of life. Man has by his reason developed the unnatural conditions of modern life and unless by the use of his intellectual powers he can devise means of saving the individual from his physical sins there will soon be no individuals to save. Doubtless if Nature is given sway, in the course of ages she would produce a race which would not suffer from appendicitis by killing off all those with improper appendices, but the surgeon steps in and thwarts her intentions by cutting out the appendix and, saving the individual as fast as Nature dooms him. Another weak point is the tonsillar ring and the "good" mother is wreaking her vengeance in no uncertain way at this point. Here however modern civilization has developed her throat surgeon whose business it is to halt destruction as it shows its ruthless hand on the innocent child and say in effect "I will interfere with the suffering and untold damage inflicted on the individual through the lymphatics of the throat by cutting them out." Of course Nature will find other weak points and her destroying power will triumph in the end unless civilized man is able to wrest enough more of her secrets to thwart her as he is now doing on the organs mentioned. It must not be forgotten that the most distinguishing characteristic of modern civilization is its individualism, something which seems abhorrent to Nature. It therefore behooves civilization to guard its individuals most zealously and let Nature take care of evolution. We need give ourselves no concern in upholding evolution, Nature will do that in spite of us. As reasoning beings it devolves on us to have something to say on civilized selection and not impotently to leave the whole thing to natural selection. A large part of the practice of medicine is built up on the theory of saving man from the punishment which Nature is bent on inflicting on him for his physical sins and there is no call to hesitate in the matter of the tonsils any more than in the matter of the appendix or cancer. The physician shapes his actions on the plan of helping the individual by helping him to secure the greatest amount possible of Nature's beneficence and avoiding the greatest amount possible of her malevolence.]

Infection from the Tonsil. Geo. B. Wood, whose valuable work on tonsillar infections has been noticed in previous volumes, presents an exhaustive research[1] on the subject of the upper respiratory tract in the etiology of cryptogenetic infections, especially in relation to pleuritis.

In 34 persons, dead of pulmonary tuberculosis, examination of the tonsils showed absolutely typical tuberculosis lesions in 29 and probably tuberculous lesions in 2.

As all parts of the oropharynx and mouth were exposed to the tuberculous sputa equally with the tonsil, the fact that the tonsils were so much oftener the seat of infection than the rest of the exposed surface seems to prove that for the tuberculosis germ, at least, the tonsil is many more times susceptible than other portions of the throat. The details of the various experiments and examinations are very interesting but there is only room here for the

---

(1) Annals Otol., Rhinol. and Laryngol., December, 1908.

conclusions, which are as follows: An infecting focus of the upper respiratory tract, and this is most frequently found in the tonsils, may give rise to a pure toxemia or even to a bacteremia. Toxemia is a very frequent condition, and because of its frequency is the most important form of infection coming from the tonsils. Bacteremia originating from the throat is comparatively rare, though a large number of cases have been reported. In either condition, if the pleura is a point of least resistance, as it is in a large majority of phthisical patients, it may very easily be more or less affected by the poison circulating in the blood. The faucial tonsils may present unrecognizable foci of infection, causing in many individuals a mild toxemia, which toxemia, however, is of importance only when the resistance of the individual is below normal.

In exceptional cases there may exist lymphatic anastomosis between the deep cervical lymph-nodes and the supraclavicular glands. It is probable that the supraclavicular glands receive afferent lymph-vessels which drain the parietal apical pleura. Occasionally the efferent of the supraclavicular glands empties into a node situated in the notch formed by the junction of the subclavian and internal jugular veins. This node may also receive the efferent lymph-vessels of the deep cervical lymph-nodes, and is only separated from the pleural apices by the internal carotid artery and its sheath. It is conceivable that lesions of this gland might cause a retrograde current which would carry the infection to the supraclavicular nodes, or a periadenitis of this node might possibly involve the pleura directly through continuity of structure. The necessary links in this infection, however, are so numerous and independent one of the other, that only in very rare cases would it happen that they would all be present so as to form a direct path from the throat to the pleural apex.

Operation. A radical difference of opinion between English and American operators on the subject of *tonsil removal* is apparent from a fairly typical discussion of the subject which occurred in the Laryngological sections of the national medical associations of the two countries in 1908. The British laryngologists of prominence seemed pretty generally agreed that cutting off a part of the tonsil was the proper operation in most cases, radical removal being done only in specially aggravated cases. On the other hand, the American laryngologists taking part in the discussion almost unanimously agreed that a tonsil which called for any cutting operation should be completely removed. The feeling being that an inoffensive tonsil should be let alone while a troublesome one should be dissected out. The British operator is partial to the guillotine while this instrument has been almost completely laid aside by his American colleague. This difference in the choice of instruments illustrates the difference in the operation done, as it is rarely possible to do a complete enucleation with a tonsillotome.

F. C. Ard[1] considers that the *dangers* associated with the removal of the faucial and pharyngeal tonsils are not as thoroughly appreciated as they ought to be. He was led to abandon the use of chloroform in these cases after two or three narrow escapes in his own practice and learning of fatalities in the practice of others. He has found 85 cases of severe hemorrhage reported, 14 resulting fatally. Comparatively few of such cases are ever reported. The author's paper contains a synopsis of a large number of the hemorrhages and other accidents which have been reported.

He believes that the operation is often done by physicians with but vague ideas of the risks involved and the accidents which may occur. A study of the literature will soon satisfy one that the procedure is not trivial, and there is much to substantiate the claim of some writers that the modern operation for the removal of tonsils and adenoids should be considered a major, rather than a minor one.

E. J. Brown[2] claims success in the use of a 3 per cent. *quinin hydrochlorid* solution as an anesthetic in tonsillectomy. He uses about 70 minims of the solution with 10 minims of adrenalin solution, injecting into the pillars and the deep parts of the tonsil.

Tonsillotomy—Death After. An unusual case of *death after tonsillotomy and adenectomy* is reported by D. J. G.

---

(1) Medical Record, March 6, 1909.
(2) Jour. Am. Med. Assoc., Aug. 8, 1908.

Wishart.[1] The patient was a girl of 18 years presenting no symptoms out of the ordinary excepting the presence of enlarged tonsils and adenoids. The tonsils were coated with secretion and the crypts filled with the ordinary cheesy deposit. While the author does not mention that the tonsils were acutely inflamed it would appear that such an inflammation was just beginning. The operation was done under general anesthesia with moderate hemorrhage. An hour or so later febrile symptoms set in, the temperature rising almost hour by hour to 101, 102, 103, 104, 105, 106 and 107 degrees. With the development of high temperature there was advancing cyanosis and coldness of the extremities. The patient died twelve hours after the operation. The cause of death was probably acute septic infection. Whether the result would have been different had complete enucleation been done instead of tonsillotomy is a thought that naturally arises.

Hemorrhage. Two cases of severe hemorrhage following tonsillectomy are reported, one by C. R. Dufour[2] in a man of 35, the operation being done with a cold wire snare, the other by O. J. Stein[1] in a woman of 20 in which a knife and scissors were used.

In Dufour's case hemorrhage came on several hours after operation and it was estimated that 3 or 4 pints of blood were lost. Hemorrhage was finally controlled by suturing the anterior and posterior pillars together quite snugly.

In Stein's case there was no large vessel involved but the bleeding was due to general oozing. Many various procedures were tried but it was only after applying a Stoerck-Mickulicz tonsil hemostat for two hours that the bleeding stopped. Stein believes that the hemorrhage was due to the fact that the patient was menstruating at the time of operation and states that he avoids operating under such circumstances but neglected in this instance to inquire regarding this point.

The Tonsils and Deafness. J. N. Reik[3] draws a strong indictment against the *small degenerate tonsil* as an etiologic factor in the production of middle ear deafness. He

---

(1) Laryngoscope, February, 1909.
(2) Laryngoscope, May, 1908.
(3) Laryngoscope, December, 1908.

reports a number of cases in which the hearing was markedly improved by the enucleation of small diseased tonsils. He believes the improvement resulted chiefly from the establishment of free action in the muscular pillars which aids in the proper functioning of the eustachian tube. He concludes, "From a study of these cases, seen in private practice, and others of a similar character treated in the dispensary, the importance of carefully looking for these diseased glands and getting rid of them completely when found in all cases of beginning or progressive middle ear deafness, has been impressed upon me; not that the enucleation of such degenerate tonsils will always arrest the progress of or cure the condition, but that it will eliminate at least one of the possibly important factors in the production of such condition."

Tuberculosis. A case of secondary tuberculosis of the tonsil is reported by N. L. Wilson[1] to illustrate the danger of giving large doses of iodids to tuberculous patients. The patient, a man of 46, had improved in his general condition but sought treatment for the tonsil. The author diagnosed tuberculosis of the tonsil, but shortly after two other physicians agreed that the disease was syphilitic and placed the patient on 20 grain doses of potassium iodid three times daily. The patient immediately grew worse, the lungs broke down rapidly and death occurred in a little over two months. Wilson urges great care in diagnosis in suspected tuberculosis, avoiding the resort to iodids unless there is a very reasonable doubt as to the nature of the case. A tuberculous patient will stand small doses, 3 to 5 grains, of iodid of potash but large doses are as a rule badly borne.

Tonsillolith. J. M. Anders[2] reports a tonsillolith which was 1¼ inches in its greatest diameter and weighed 189 grains. The author could find no record of any other case which approached this in size.

The patient was a man of 59 who had not noticed any special trouble with the tonsil until 3 or 4 months before. The stone was dislodged during a severe attack of coughing.

---

(1) Laryngoscope, April, 1908.
(2) Jour. Am. Med. Assoc., April 11, 1908.

Peritonsillar Abscess—Protracted Suppuration Following. W. Roth[1] reports two cases in which after peritonsillar abscesses had been opened the suppuration continued, in the one case for two months and in the other for six months. This he remarks is very rare, as the suppuration usually ceases promptly when the abscess opens spontaneously or is opened at its lowest point, which is usually the case. The movements of speech, swallowing and chewing also tend to secure a good outlet for the pus. In the two cases reported the reason for the protracted suppuration was found in the fact that the abscess had formed in the lower part of the tonsil and the pus gravitating downwards had not found a ready exit but a chronic suppurating cavity was formed. The probe took a downward course indicating that the lowest point of the abscess cavity was below the level of the opening which had been made by the knife. When the wall of the tonsil was slit down to the lowest level of the cavity and the incision prevented from healing too rapidly the suppuration quickly ceased.

THE LARYNX.

Anatomic Supports of the Larynx. P. Sebileau[2] recalls the relation of the hyoid and thyroid in man to the branchial arches in fishes and shows that the function of the hyoid in man is to suspend the larynx from the base of the cranium in the manner that the gills of fishes are attached to the skull bones and that with the thyroid, it, like the branchial arches, forms a part of the provision for the protection of the respiratory organs.

Laryngoptosis. The conception of a ptosis of the larynx similar to that of the abdominal organs is discussed by H. Quincke[3] and illustrated by two cases in which this condition was favored by a kyphosis of the cervical vertebræ and an unusual relaxation of the muscles of deglutition by which the larynx was allowed to sink nearly to the opening of the thorax. The condition occasioned difficulty of swallowing so marked in one case that an obstruction to

---

(1) Wien. med. Woch., Nr. 16, 1908.
(2) Annales des malad. de l'oreille, du larynx, etc., April, 1908.
(3) Berlin. klin. Woch., Dec. 7, 1908.

the passage of a sound led to the diagnosis of a stricture of the esophagus which was not sustained by the autopsy findings. The author has determined the extent to which the larynx sinks in the upright position and finds that there is an average sinking of the cricoid cartilage of about 4 mm. which is least in middle age but much more pronounced in old age. The sinking depends not only on the relaxation of the muscles of deglutition but on the ptosis of the lower jaw by which the support of the muscles is lowered so that the larynx can not be maintained at its usual level. The sinking of the lower jaw is favored by the occurrence of inflammation in the throat or by nervous diseases especially apoplexy and consequent paresis of the muscles of the throat and tongue. Snoring is a symptom referable to the muscular relaxation which causes the descent of the lower jaw. Snoring is favored by the position taken when asleep. The most undesirable position is partly sitting or lying on the back. Lying on one side with a pillow arranged to support the soft parts of the face is a means of prevention. If necessary a bandage can be arranged to support the lower jaw. Gymnastic exercise of the muscles of mastication and deglutition may prove of great service.

Bacteria in the Larynx. O. Frankenburger[1] showed in a previous article that the mucous membrane of the larynx of healthy persons is not always sterile but may harbor various microorganisms, e. g., the bacillus of Friedlander, staphylococci, streptococci, bacillus pyocyaneus, etc. The tubercle bacillus was not found in his previous experiments, but he has continued the work and has achieved results which convince him that tubercle bacilli may exist on the laryngeal mucosa of well persons free from tuberculosis. He experimented as follows: A small piece of cotton was held in a tube by fine forceps so that it was protected from touching the mucous membrane of the pharynx so that contamination by the secretions of the mouth and pharynx was prevented. When the tube reached the larynx the cotton was protruded and wiped over the mucosa of the larynx, taking up some of the mucus. It was then pulled back into the tube and the tube withdrawn. The specimen

---

(1) Annales des malad. de l'oreille, du larynx, etc., July, 1908.

thus obtained was cultivated, and eventually the culture injected into guinea pigs and rabbits. In some cases the animals remained well; in others abscesses formed showing the presence of various pathogenic microorganisms and in one case tubercles developed containing tubercle bacilli. Frankenburger reasons that these bacilli must have penetrated by inhalation and that a primary infection of the larynx is thus possible. He cites pneumokoniosis as showing that dust may penetrate into the deepest portions of the lungs and if this may happen with mineral substances it may also occur with the tubercle bacilli.

Laryngitis Following Intubation. According to J. Glover[1] ulceration of the larynx is sometimes found in infants dying after intubation and these ulcerations when the child does not promptly perish may lead to very serious complications. The contraction of the glottis sometimes necessitates tracheotomy. Generally the laryngitis is less severe and the termination favorable. The lesions may occur at three periods: 1. They may be due to trauma in introducing the tube. 2. They may be the result of decubitus from the intolerance of the tissues for the tube. 3. They may occur from trauma produced in withdrawing the tube. The injury in introduction is frequently but not always due to lack of skill. Such ulcerations are found on the vocal cords or above them in the vestibule of the larynx. In many cases the inflammation and swelling that cause the croup are situated in the cricoid region below the vocal cords and leave the cords free so that the voice is clear. In some of these cases the obstruction is so largely due to spasm that a single introduction of the tube followed by withdrawal after a short time results in more or less permanent relief. In such cases the author advocates the repeated introduction of the tube with withdrawal after a short time rather than a permanent intubation. In such cases the ulceration occurs below the vocal cords and must be attributed to the pressure of the tube when allowed to remain, as experiment shows that this part of the larynx can not be injured in the process of introducing the tube. In some cases the sensitiveness of the larynx is such as to cause the immediate rejection of the tube and

---

(1) Annales des Malad. de l'oreille, du larynx, etc., March, 1908.

the spasm may necessitate repeated introduction in order to save life. Traumatism during the removal of the tube is almost always due to the instruments used to grasp the tube and therefore Glover recommends the withdrawal of the tube by manual means. This method so far as he knows has produced no lesion. His method consists in pressing on the lower end of the tube with the thumb and by upward pressure pushing it out of the larynx.

Leech in Trachea. Tapia[1] reports the case of a man of 22 who swallowed a leech which passed into the trachea where it was located by direct tracheoscopy and extracted by forceps with final recovery.

Death in Cases of Paralysis of the Recurrent Laryngeal. J. Glover[2] calls attention to the manner in which death may be occasioned when a disease of the vagus has led to paralysis of the recurrent laryngeal. In these cases a spread of the lesion from the vagus to the phrenic or to the sympathetic may occasion death by the effect on the respiration or the heart. The respiration becomes affected by the paralysis of the phrenic and by a reflex influence from this upon the intercostal nerves. On the other hand a reflex from the phrenic to the vagus may occasion paralysis of the cardiac fibers of the vagus by which the heart becomes rapid and irregular and weak or on the other hand disease of the sympathetic will cause slowing and arrest of the heart. Previous disease of one of these great systems would favor the progress of the reflex paralysis.

Singer's Tubercles. By this term are designated small swellings occurring on the vocal cords on the anterior half in those who use their voices professionally, chiefly in singers. They occur mostly in the female sex. The hypotheses which have been put forward to account for these swellings are not satisfactory because they do not explain the peculiar situation on the anterior half of the vocal cord. Friction, overexertion, or the development of a gland under the edge of the cord have been suggested as the source of these swellings, but the first two do not account for the peculiar location and no indication of gland tissue has been found in most of the cases examined

---

(1) Annales des malad. de l'oreille, du larynx, etc., March, 1908.
(2) Annales des malad. de l'oreille, du larynx, etc., May, 1908.

histologically. E. Barth[1] advances the hypothesis that these growths are due to friction between the cord and the epiglottis which is occasioned with the higher tones by the drawing up of the larynx in consequence of the fixation of the hyoid bone and drawing the thyroid cartilage up to follow it. This explanation accounts for the location of the tubercles, the anterior half of the glottis being the part that is thus most compressed. The author finds that this compression occurs when in producing the high notes the larynx is drawn up instead of downward as it is when the proper technic is followed.

This theory leads to a proper therapy. The larynx should be rested, as the growths will disappear spontaneously if rest be given. This should be followed by the adoption of improved technic in the use of the voice. In cases in which the growths have reached a size which will not permit of their removal by rest surgical measures may be resorted to, but this should be only as a last resort as in cases of this sort where the voice is a commercial asset care must be taken not to injure the vocal cords, as a small defect left after operation may make the organ as inefficient as it was in consequence of the tubercle.

TUBERCULOSIS.

The editor feels that the great importance of this subject to every practitioner warrants the large amount of space devoted to it in this volume each year. Death from pulmonary tuberculosis is comparatively painless, but when, as in a large per cent. of cases, the larynx becomes involved the sufferings of the patient are so great that every effort should be made to secure relief. More than of any other disease it may be said of laryngeal tuberculosis that successful treatment, either as to relief or cure, is not to be expected from a careless or easily discouraged physician and it is only by continual reference to the work of the hopeful and persevering practitioner in this line that courage is gained to attack the disease with hope of giving relief.

Relations of Laryngeal to Pulmonary Tuberculosis. L. Laub[2] undertakes to determine by statistics whether a cor-

---

(1) Berlin. klin. Wschnschr., Aug. 17, 1908.
(2) Archiv f. Laryngologie u. Rhinologie, B. 21, H. 1.

respondence exists between the side of the larynx affected and the side on which disease of the lung exists. He found 114 cases of laryngeal tuberculosis. Of these 12 had to be excluded because the side of the lung affection could not be determined. Another 10 per cent. of laryngeal cases were unavailable for the statistics because the laryngeal affection was median. Of the 114 cases 61 or 53.5 per cent. were unilateral and 31 or 27.2 per cent. were bilateral. Of the entire 114 cases 30.6 per cent. were at the same time unilateral and on the corresponding side with the lung affection and 22.8 per cent. on the opposite side. From these figures it is evident that correspondence cannot be established as a rule. Other authors have found varying proportions, but Laub found by far the greatest proportion of unilateral cases.

Laub discusses also the way in which the tuberculous invasion reaches the larynx and concludes that the action of tuberculous sputum plays the principal role and that this generally corresponds with the gravity of the disease, which also exerts a predisposing influence. The inhalation of dust, especially of a metallic nature, or any influence which tends to injure the mucous membrane of the larynx, may also be set down as predisposing to the laryngeal affection.

Treatment. J. A. Patterson[1] of Colorado Springs is impressed by the *importance of the climatic influence* upon laryngeal tuberculosis. He says: "I shall never forget the fear in attempting the control and betterment of laryngeal tuberculosis engendered by experiences on the eastern seaboard that assailed me in beginning work in this line in Colorado, but I well remember the surprise that awaited me as a result of my efforts. I began seeing cases that I should have considered utterly hopeless, improving under methods that were futile elsewhere."

Beverly Robinson[2] advocates the use of the *perforated zinc inhaler* (Fig. 20) in tuberculosis of the larynx. He says:

"I regard as by far the most important local measure to be employed by every sufferer from laryngeal tubercu-

---

(1) Laryngoscope, September, 1908.
(2) Am. Jour. Med. Sciences, August, 1908.

losis at any stage of the disease, ... is the frequent, persistent, long-continued use of the perforated zinc inhaler with inhalations of creosote and alcohol, or, when there is much irritative cough, of beechwood creasote, alcohol, and spirit of chloroform in equal parts. This is no new fact to me, but has become more and more a firm conviction. I have already several times directed attention to it, and I now reiterate it because of its great value. In 1885, at the second meeting of the Climatological Association, I read a paper on antiseptic inhalations, in which I first directed attention to the great value of these inhalations in many forms of laryngeal, bronchial, and even pulmonary disease. Later, in my little work on *Inhalers and Inhalants,* I again affirmed the value of these inhalations. And in more than one article in medical journals, or in remarks before societies, since that time, I have recurred to their importance. These inhalations modify sputum favorably, diminish its quantity, lessen cough, thus promoting rest, sleep, and nutrition, and general improvement physically, and in some instances appear to be the means through which the patient has gotten rid of tubercle bacilli permanently. I know of absolutely no other method, no other local application, no surgical measure, which will afford anything like the same amount of relief to symptoms

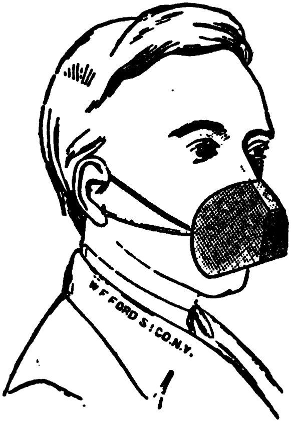

W F FORD S & CO. N.Y.

Fig. 20.

and hasten and promote cure in suitable cases to the same degree as will the perforated zinc inhaler with the inhaling fluid recommended."

Six or eight drops of the mixture used should be dropped on the sponge in the inhaler every hour during the day and several times at night.

The treatment by *direct sunlight* has been tried at various times with some success, but the uncertainty of the light supply in northern climates has rather interfered with the extensive use of the agent. J. Kramer[1] of San Remo, describes a case in which direct sunlight was used with resulting cure. The patient, a man of 31, had had laryngeal symptoms for more than 6 months under the care of Fraenkel who referred him to Kramer for the sunlight treatment. The interior of the larynx was completely hidden by the great swelling of the epiglottis and the arytenoids. The patient used an ordinary toilet mirror and a larynx mirror to throw the light on the swollen parts. At first he applied the light a few minutes twice daily but he gradually increased the time until the applications lasted an hour at each of the two treatments. Two weeks sufficed to reduce the swelling sufficiently to render the interior of the larynx visible and show that both the false cords were ulcerated. Treatment extended over a period of four months when the patient was to all appearances cured. Besides the light treatment the patient inhaled vapor from a menthol preparation for an hour three times daily and received insufflations of menthol-iodol and aristol after two of the inhalation periods.

The pulmonary disease was mild and confined to the infrascapular region of one lung. This also disappeared during the patient's stay at San Remo.

Anesthesia in the Treatment of Inflammation and of Laryngeal Tuberculosis. G. Spiess[2] advances the following theory of inflammation on which he founds a method of treatment of the condition especially applicable in tuberculosis of the larynx. Of the four cardinal symptoms of inflammation, redness, heat, swelling and pain he regards the pain as primary, being a reaction of the sensory nerves

---

(1) Archiv f. Laryngol. u. Rhinol., B. 21, H. 3.
(2) Archiv f. Laryngol. u. Rhinol., B. 21, H. 1.

to the irritant which produces reflex hyperemia, heat and swelling and the swelling by pressure on the nerves causes more pain until the swelling finally becomes so great as to anesthetize the nerves, when the other symptoms also abate. Regarding the swelling as simply a means by which nature relieves herself of the pain, he proposes to cut short the process by introducing an artificial anesthetic. Accordingly he believes that it is desirable to treat inflammation with frequent applications of anesthetics after removing any part that requires removal by surgical means. He formerly applied powders such as orthoform or anesthesin, but lately he has resorted to injections of novocain, which he makes two or more times daily according to the nature of the case. By means of a properly constructed syringe it is possible to make injections into any part of the larynx. He uses novocain in from 2 to 5 per cent. solution and usually uses from 1 to 2 c.c. according to the number of injections to be made. The first injection is preceded by cocain anesthesia, but when the patient is accustomed to the procedure, a few drops of 5 or 10 per cent. solution of novocain are sufficient and often the injection can be made without any previous anesthesia. Generally, an injection twice a day is sufficient but when there is much pain in swallowing more frequent applications may be necessary. This method of treatment is effective by itself, in cases in which no ulceration is present, but where there is an epithelial defect, it should be combined with surgical measures. Everything which can be removed surgically should be removed. For this purpose double curettes and a series of sharp forceps may be used. Of the older caustics the author prefers trichloracetic acid, as it can be introduced on a probe and applied exactly to the place which it is desired to cauterize, which cannot be done with a solution of lactic acid. The author's results in uncomplicated cases with anesthesia alone are excellent especially since he has used the injection method and his results with the combined method of anesthesia and surgery have improved until they are now very satisfactory. He reports the following cases:

1. Mrs. G., aged 34, of robust appearance, suffered from a slight unilateral affection of the lung, but presented a

large, elevated tuberculous ulcer on the posterior wall of the larynx. This was thoroughly curetted 7 or 8 times and afterwards cauterized with lactic acid, later with trichloracetic acid. It repeatedly formed again, reaching its original size in from 4 to 8 weeks.

Injections were now begun, after preliminary cauterization, at first daily for a week and then every other day for two weeks. The ulcer healed under this treatment in about four weeks, after it had repeatedly relapsed for a year and a half.

2. Mr. B., aged 32. In connection with slight bilateral lung affection there remained after the healing of other tuberculous ulcers in the larynx a fissure-like tuberculous ulcer in the right side. All therapeutic measures, caustics and curettement were unsuccessful; the ulcer could not be healed. The general condition was rapidly growing worse. The patient could hardly climb the stairs. The prognosis was absolutely unfavorable. As a last resort the injections were begun. After 14 days the ulcer showed a decidedly better appearance, the difficulty in swallowing had quite disappeared and after a few weeks the ulcer was no longer to be seen; it was completely healed. The general condition had improved so much in a few months as to allow the patient to take a sea voyage of several months. At present after three years there has been no relapse.

Mr. C., aged 52, was affected in addition to light lung affection with a tuberculous ulcer of the size of a bean on the right side of the larynx. The ulcer was excised with a double curette and then after treatment with injections was begun by the author and afterward carried out by a specialist at his home. The operated place healed remarkably quickly and after a small open place was cauterized with trichloracetic acid four weeks later and injections kept up for a week the ulcer which had obstinately returned for 10 months was healed.

S. M. Bourack[1] *sums up the local treatment* as follows: During the first few weeks no operative treatment should be undertaken if there are no indications which make it imperative, such as the presence of stenosing granulations,

---

(1) Archives Internat. de laryngologie, d'otologie, et de rhinologie, January-February, 1909.

severe dysphagia, due to ulceration of the laryngeal vestibule, etc. The treatment should be conservative, consisting of inhalations and sprays of the ordinarily employed resolvents, or of sedative or antiseptic balsamic remedies; for example menthol, balsam of peru, eucalyptol, oil of pine, phenol, hydrogen dioxid, morphin, sodium iodid or bromid, or bicarbonate, or chloral may be employed. The patient can use the treatment himself several times a day at home. The ordinary oily solutions may be used, such as menthol in 5 to 10 or 20 per cent. solution. More rarely such astringents as resorcin, acetate of lead, alumnol, etc., may be used. Or the insufflation of various powders such as iodol, europhen, orthoform, anesthesin, or aristol may be substituted. More rarely iodoform, boric acid, etc., may be used. Caustic applications of lactic or chromic acid in various strengths may be made or of parachlorophenol, phenosalyl, formalin, or of the mixture of lactic acid, formalin and carbolic acid, or methylene blue.

Lake's solution:

Lactic acid 80 per cent., formalin 7 per cent., phenol 10 per cent.

In cauterizing it should be borne in mind that if the whole surface of the vocal cords for instance is touched with the lactic acid solution unnecessary harm is done. The cauterization should be strictly topical. The method employed must depend on the case, the skill of the physician, etc. Intratracheal injections of oil solutions of menthol, eucalyptol, etc., may be tried. Fouscher recommends to inject from a few drops to 3 c. c. of the following: Menthol, 1; eucalyptol, 10; sterilized olive oil, 100. He considers intratracheal injections contraindicated in hemoptysis and when there is an evident tendency to spasm of the larynx. Harland recommends the following solution in oil: Menthol 1 to 10 per cent., acetate of morphin 0.008 per cent., chloroform 0.3 per cent., camphor 1 to 2 per cent. As an antiseptic he uses essence of thyme (thymol) 2 per cent.; eucalyptol 2 per cent.; salol 3 per cent.; ichthyol up to 2 per cent.; permanganate of potassium 0.008 per cent. Mendel injects in the trachea every day 9 c. c. of solution of eucalyptol in strength of from 1 to 10 per cent.

Against special symptoms like cough, dysphagia, etc., insufflations of heroin, dionin, anesthesin, orthoform, morphin, etc., are recommended.

The patient should be advised to avoid anything that tires the vocal organs, such as reading aloud, singing, animated conversation, etc. Absolute silence is highly recommended by many authors. The internal use of potassium iodid and mercury has been highly recommended by a number of authors, but Bourack thinks that it must still be regarded as under trial.

If the disease shows a tendency to progress in spite of medical measures, resort should be had to the curette in case the pulmonary disease is not too far advanced, and even in such cases it may be advisable to recommend to the patient extensive surgical procedures if it is evident that a laryngeal affection which is markedly aggravating the general condition can be removed or greatly improved by them. In cases in which the ulcers are too deep or are so situated as not to be easily reached by the curette they may be treated by the galvano-cautery. Vegetations on the posterior aspect of the larynx which show little tendency to ulceration should be left alone, unless the functional trouble which they produce is sufficiently serious to make their removal desirable. If operation is not well borne or if healing does not ensue, the treatment should not be persisted in, but a return to medical treatment should be made, or solar light, x-rays, or other physical methods may be tried.

If the general condition, and especially that of the lungs, gives any reason to hope, electrolysis may be tried or even an opening of the larynx from the outside or its total ablation may be proposed.

Theodor Heryng, whose name is associated with the *active surgical treatment* of laryngeal tuberculosis, presents his views in a recent article.[1] As he says, Nature, unaided by special, local or general treatment, can heal laryngeal tuberculosis. Most frequently superficial ulcers of the vocal cords and milder cases of affection of the posterior wall of the larynx and processus vocales heal by cicatrization. Severe, destructive processes, which are accompanied

---

(1) Ann. Otol., Rhinol., Laryngol., December, 1908.

by granulation formation and lesion of cartilage, followed by dysphagia and consequently rapidly leading to malnutrition and cachexia, very rarely heal, especially in young patients and those affected with diffuse pulmonary affections, accompanied by fever and lowered body resistance.

The best chances for healing are found in those cases where the disease appears as a localized infiltration or tumor-like prominence on the posterior laryngeal wall, which has little or no tendency towards degeneration, causes slight symptoms and is accompanied by no apparent loss of bodily vigor. Here belong, also, the so-called tubercular tumors of the larynx, especially of the false cords.

The worst prognosis is to be given in the diffuse infiltrations of the outer laryngeal borders, viz., the epiglottis, when they extend over on the false cords and attack the ventricle; furthermore, infiltration of the arytenoid cartilages, which leads to rapid destruction and necrosis, or when accompanied by granulation formation, causes stenosis; also the diffuse, degenerative infiltrations, involving the larynx in toto; finally miliary tuberculosis.

The possibility of a cure is, in the first place, dependent on the constitution and resistance of the patient, the anatomic character of the pulmonary affection and its extent, the age of the patient, his occupation, his financial status, and the period at which the proper treatment is begun.

Of all the drugs used in the disease, such as creosote-glycerin, phenol, balsam of peru, sublimate, iodoform, codol, menthol, etc., the only one that has gained a distinct position in the therapy is lactic acid.

This remedy cannot, however, be used in all cases, as it often causes severe inflammatory symptoms. It is indicated in hypertrophic ulcers, in soft granulations, and for the purpose of cleansing the floors of ulcers. It has little effect on hard infiltrations.

For several years the author has used concentrated potassium permanganate solutions for the destruction of unclean tubercular ulcers, which constantly renew their dirty gray exudate. This seems to secure healthy granulation even after failure with the electro-cautery. Its use is painless and without reaction. The black scab is cast off in two or three days, according to the intensity of the cauterization. Never allow crystals to remain on the swab. The action is very deep, the tissue melts away by a quick necrosis and a deep defect remains. The crystals are to be avoided on account of the severe pain which they cause.

The solution is best made in a reagent glass, heated to boiling, the crystals pulverized by a glass rod and the fluid carefully decanted from the precipitate and cooled. The swab must have no excess of solution. Paint until the ulcer has a very dark color. The dysphagia frequently becomes less after the cauterization.

The author traces the fight he has made for surgical treatment of laryngeal tuberculosis since 1888 and quotes various authorities on the question.

The fear of new infection from the fresh wounds produced and the fear of dangerous hemorrhage he claims to be unwarranted. Spiess estimates that he has curetted 6,000 times in the past 15 years without observing any new infection and has secured many cures. Krause has curetted about 4,000 times without a secondary infection. Krieg cured 60 out of 200 poor patients by this method. Figures from other operators are also quoted.

According to reports given by Heryng, in over 10,000 cases there have been 6 fatal and 15 severe hemorrhages. The author himself has had 8 severe hemorrhages in 1,000 curettements, all of which were checked.

In order to prevent purulent infection of the wound, Heryng uses a 1 to 2 per cent. solution of malachite-green in alcohol, an agent which he has found a better antiseptic than pyoktanin. His directions for use are as follows: The malachite-green should be used only with a cotton-wound applicator, and only to the extent of a dark green coloration of the wound. Care must be taken to avoid an excess of the drug, by dipping the applicator in a vessel containing only enough fluid to be absorbed by the cotton. After the application the patient must neither cough nor spit. Only after some time may he take a drink of water. Should the lips or chin be stained, alcohol will remove the stain.

Surgical treatment is indicated: (a) In tubercular tumors of the larynx. (b) In circumscribed, chronic, tumor-like infiltrations of the posterior laryngeal wall which show little tendency towards degeneration. (c) In chronic ulcers, resting on an infiltrated base and surrounded by granulation products, which resist other methods of treatment. (d) In unilateral disease of the larynx, even when the epiglottis, false cords and aryepiglottic folds are involved.

It is contraindicated: (a) In severe pulmonary phthisis combined with malnutrition and wasting. (b) In diffuse miliary tuberculosis of the larynx or of the larynx and pharynx. (3) In all cachetic conditions. (d) In severe laryngeal stenosis caused by inflammatory swelling of the affected parts (here the quickest possible tracheotomy is demanded). (e) In frightened, nervous, irritative, distrustful, listless patients and those who frequently change doctors, but especially in persons whose general condition promises little for cure.

The surgical treatment demands from the physician devotion to the patient, patience and great perseverance, as well as the most complete knowledge of the technic and an exact, sharp instrument. The greatest attention must be used in the after-treatment, and the patients should be under observation for months and often years.

The author's further observations are:

(1) The electro-cautery treatment alone, or combined with surgical intervention, gives the best results in localized infiltrations and relatively good general condition.

(2) The fear of tubercular infection and severe hemorrhage is unfounded.

(3) Severe cases of laryngeal and pulmonary phthisis should be treated in sanatoria by specialists thoroughly trained in the technic.

TUMORS.

Scleroma. As noted in former issues of this volume the only real success attained in the treatment of this disease has been from the use of the x-rays. E. Mayer[1] gives a later report on a patient formerly reported on by him. The patient was a well-nourished young woman in whom the laryngeal thickening became so great as to necessitate tracheotomy. Through the tracheal opening five-minute exposures to a high-frequency current at a distance of 8 inches were given. At first the treatments were given under chloroform anesthesia but later the anesthetic became unnecessary. Three or four exposures a week were given for six weeks, resulting in a complete cure. The tracheal wound was allowed to close and an examination more than a year later showed no signs of a recurrence.

Thyrotomy Under Local Anesthesia. E. J. Moure[1] recommends the splitting of the thyroid cartilage, generally called laryngofissure, for the successful removal of malignant growths which are usually attached to one of the vocal cords. The operation may be carried on under local anesthesia, which is of decided advantage, as in adult patients the passage of blood into the trachea can be completely prevented so long as they are awake. Moure advises, in order to prevent the swallowing of blood, to divide some rings of the trachea first and insert a canula, which serves as a tampon to prevent the blood from running into the trachea and renders a special position of the patient unnecessary. B. Fraenkel[2] advises the administration of local anesthesia, either by Schleich's method of infiltration, using a 1 per cent. cocain solution with 3 drops of 1-1000 adrenalin solution, or by the injection of a 10 per cent. cocain solution with the addition of some adrenalin. In the latter case he makes the injection on both sides of and not far from the median line above and below the thyroid cartilage, using altogether 0.4 gm. (⅔ grain) of cocain. The proper time is allowed for the anesthesia to become complete and the operation is proceeded with. For the anesthesia of the mucous membrane injections of cocain about the trunk of the superior laryngeal nerve have been recommended by Bier, but Fraenkel adheres to his former custom of spraying the mucous membrane with a 1 per cent. solution of cocain combined with the application of a 20 per cent. cocain solution to which some suprarenal preparation has been added. Moure directs that when the larynx has been opened the mucous membrane shall be rendered insensible by a solution of cocain 1 to 60, to which 2 or 3 drops of a 1 to 1,000 solution of adrenalin has been added,

---

(1) Archiv f. Laryngologie u. Rhinologie, B. 21, H. 2.
(2) Ibid.

but he warns that the patient must be watched from this time on, as conditions may arise from the action of the cocain which will cause a sudden syncope and even stoppage of the respiration. Naturally the amount of cocain used for children must be diminished according to their age.

Laryngotomy. While the scope of this yearbook does not ordinarily include a description of the more radical operations, being intended as it is for the general practitioner, yet it has seemed well to the editor to include in this year's volume a description of the technic of the above operation which is quite well given by D. C. Greene.[1]

Previous to the year 1888 radical operations on the larynx for malignant growths were justly to be regarded as among the most dangerous of surgical operations. As shown by the tables of Sendziak, the mortality up to that time from the operation of total laryngectomy in 147 cases was 39%, and that from the operation of laryngotomy in 89 cases was 13½%. These figures represent a careful tabulation of the cases reported in medical literature up to the year 1888 and must be considered as understating the actual mortality. For, as is well known, the results of successful operations are more often published than those of unsuccessful ones.

The cause of this high mortality may be traced in the first place to a poor selection of cases with regard both to the extent of the local disease and to the general physical condition of the patient; in the second place to deaths from pneumonia, due to inhalation of blood during or after the operation, or from the inhalation of food into the lower air passages after the operation; and in the third place to operative or post-operative shock.

A comparison of the statistics just given with those collected by Sendziak since 1888 up to and including 1905 is most encouraging. We find, for example, in 257 cases of total laryngectomy done since 1888 an operative mortality of 22% as against 39%—a reduction of nearly one-half; and in 210 cases of laryngotomy a mortality from the operation of only 2½% as against 13½% previous to 1888. The chief cause which has contributed to this re-

---

(1) Boston Med. and Surg. Jour., Jan. 28, 1909.

markable improvement has undoubtedly been the opportunity for a more favorable selection of cases for operation. Cases are now more commonly recognized and operated upon at an early stage, when the chances for complete removal of the growth by a comparatively safe operation are the best. But an almost equally important cause of the improvement has been the advance made in the technic of the operations and after care, especially in respect to the avoidance of operative and post-operative shock and inhalation pneumonia.

In the selection of cases, the physical condition of the patient aside from his local disease must be considered. Speaking broadly, chronic disease of the lungs contraindicates radical operation on the larynx. So, also, of disease of the heart and kidneys, although some latitude of choice in these last may be permitted if the disease is not advanced. Few individuals over sixty are absolutely normal in this respect. But the preliminary examination should always include an investigation of the condition of the lungs, heart, kidneys and the blood. If the condition of these organs is found to be satisfactory, the next question is with regard to the extent of the local disease, which may be considered in connection with the choice of operation.

In cases of early cancer situated within the cavity of the larynx, the so-called intrinsic cases, it is now almost universally acknowledged by authorities here and abroad that the operation of choice is laryngotomy; that is, splitting the larynx in the median line and removing the growth with a margin of healthy tissue without removing the cartilaginous or bony framework. Cases of intrinsic cancer of the larynx, which have extended to or beyond the limits of the cavity of the larynx without glandular involvement, are suitable for laryngectomy. So, also, are cases of early extrinsic cancer of the larynx. Cases in which the growth has extended into neighboring tissues and those in which there is evident glandular involvement are not favorable for operation, and in such a palliative tracheotomy is usually the only operative interference to be advised.

The question of operation having been decided, the preparation for the operation is next to be considered. It is obviously important that the mouth, which is necessarily in close communication with the operative field, should be made as clean as possible. The teeth should be thoroughly cleaned, cavities filled and carious stumps extracted. The skin of the neck and upper chest should be sterilized as usual for any aseptic operation. The preliminary subcutaneous injection of 1-100 gr. of atropin to which is added ⅙ to ¼ gr. of morphin at least fifteen minutes before beginning anesthesia, seems to be of great help. The atropin serves in the first place to greatly diminish the secretion of the bronchial mucous membrane, which is always stimulated by ether and is an embarrassing factor in its administration. In the second place, as shown by Crile, it serves to diminish the danger from shock, which is ever present in all operations on the larynx and trachea. On the other hand, morphin is of great help in producing a smooth ether anesthesia, an element of considerable importance in the ease and rapidity of these operations. The author has had no difficulty in preventing the escape of blood into the lower trachea by the maintenance of the extreme Trendelenburg position as recommended by Keen, and is, therefore, of the opinion that the use of morphin is a distinct advantage. Ether may be given by mouth at first and later through the tracheal opening either by means of a sponge or by a funnel and tube connected with the tracheal tube.

In the earlier operations, prophylactic tracheotomy a week or more before laryngotomy or laryngectomy was considered advisable, but the experience of later years has shown that the danger of sepsis and pneumonia is less if tracheotomy is deferred until the time of the radical operation, excepting only the cases of dyspnea. In these, preliminary tracheotomy under cocain anesthesia is advised.

TECHNIC OF LARYNGOTOMY.

The position of the patient up to the time of opening the trachea is the horizontal dorsal position with a flat pillow under the shoulders. This brings the larynx and trachea into greater prominence and facilitates the dissection. When the trachea is opened a change is made to the extreme Trendelenburg position, the long axis of the patient's body being put at an angle of nearly 45° to the horizontal plane. In order to hold the patient in this position the legs must be securely attached to the foot of the table.

The first stage of the operation comprises the exposure of the larynx and trachea by a median incision extending from the hyoid to just above the upper end of the sternum, which is interrupted for an inch below the cricoid by a bridge of skin which serves to separate the tracheal and laryngeal openings. This detail, which was devised and advocated by Dr. Solis-Cohen, of Philadelphia, helps, in some measure, to prevent contamination of the upper wound by tracheal secretions and favors healing of the upper wound by first intention. The incision is carried down successively through the fascia, separating the sternohyoid and sternothyroid muscles until the trachea and larynx have been well exposed. The position of the patient is now changed to the extreme Trendelenburg position above described. This position is maintained throughout the remainder of the operation. The trachea is now opened below the thyroid isthmus and an ordinary tracheotomy tube inserted into the trachea and held in position with tape.

The second stage of the operation comprises the division of the thyroid cartilage in the median line and the removal of the growth. Before doing this the crico-thyroid membrane is opened by a short transverse incision and a 10% solution of cocain applied on a cotton swab to the interior of the larynx. According to Crile this prevents stimulation of the inhibitory fibers of the pneumogastric, which he considers to be the cause of sudden death in operations in which the larynx and trachea are opened. The thyroid cartilage is next divided from below upwards. In young subjects this may be done with a knife, but inasmuch as in the majority of cases the thyroid cartilage has become ossified with age, it will usually be found necessary to use a saw or preferably bone shears with the blade set at an angle of about 135° to the handle. This step must be taken with great care in order to divide the anterior commissure without injuring the cords. The wings of the thyroid are now held widely apart with retractors or stout ligatures. A small self-retaining mastoid retractor is very useful here, since it opens up the thyroid well and does away with the necessity of an extra pair of hands near the field of operation, which is already sufficiently crowded by the operator, his assistant and the anesthetist. As the larynx is opened up the upper end of the trachea may be firmly packed with gauze. The interior of the larynx is then carefully inspected under good illumination with a head mirror or head light and the limits of the growth made out. A strong solution of adrenalin 1-1000 applied to the region of the growth helps to define its limits. Two elliptical incisions are made surrounding the neoplasm and including fully one-half inch of apparently healthy tissue. These are carried down to the cartilage and the entire mass including the perichondrium stripped off the cartilage. The ensuing hemorrhage is not great and is controlled by pressure. The use of the thermo-cautery at this point is not evident, although it is advocated by some authorities. It is, of course, necessary before reapproximating the wings of the thyroid to make the wounds within the larynx dry. This can usually be accomplished by pressure, although it may be necessary to tie a few vessels.

The third stage of the operation consists in the closure of the larynx. The plug is removed from the upper end of the trachea and the cut edges of the thyroid cartilage placed in as accurate a position as possible. They are held together preferably by silk sutures through the external perichondrium. The muscles and skin are next sutured in separate layers in the median line, and a small gauze wick is left in the lower end of the wound. A dry dressing is applied over the laryngeal wound and a light moist antiseptic dressing over the tracheal tube, which is retained for twenty-four hours.

After care.—In the after care of these cases the attention is especially directed to the avoidance of shock and pneumonia. Immediately after the operation the patient is put to bed with a flat pillow and the foot of the bed raised. This favors the expulsion of blood and secretions from the trachea and also conduces to the prevention of shock. A pint of normal salt solution is given by enema. The foot of the bed is kept elevated for twelve to twenty-four hours, according to the patient's condition and the severity of the operation. After laryngotomy the tracheotomy tube is immediately withdrawn by some operators. On the whole it seems safer to leave the tube in position for twenty-four hours, as by this means the drainage of blood and bronchial secretion is rendered freer and less likely to pass over the wounded surface in the larynx. After the removal of the tube it should be kept close at hand for an instant replacement if there is dyspnea.

Laryngectomy. L. Page[1] reports 2 successful cases of hemilaryngectomy for carcinoma. One patient, a man of 72, was alive and well 4 years after operation; the other, a man of 52, was in perfect health 3½ years after operation.

LARYNGEAL COMPLICATIONS.

Nervous Diseases. Laryngeal manifestations in locomotor ataxia and multiple sclerosis have been investigated by W. Freudenthal,[2] who reaches the following conclusions:

1. The larynx is frequently the seat of serious affections in tabetics.
2. Laryngeal crises are met with so often that they are almost of pathognomonic significance.
3. Unilateral and bilateral paralysis of the postici muscles are the affections par excellence in tabetics, but a unilateral paralysis of the recurrent nerve, often with the vocal cord in a hyperabducted position, as mentioned by Harland, is nothing uncommon.
4. The abductor fibers of the recurrent laryngeal nerve are affected primarily in tabes as well as in multiple sclerosis.
5. The voice in tabetics is often not changed, in spite of advanced lesions.
6. In order to reach a positive diagnosis all these cases have to be observed during a considerable period.
7. In multiple sclerosis there is frequently present a subjective dyspnea that cannot be explained by the objective signs.

Laryngeal Lesions in Beriberi. H. E. Kanasugi[1] sums up his observations on 10 cases of beriberi with affection

---

(1) Jour. Am. Med. Assoc., Sept. 26, 1908.
(2) Jour. Am. Med. Assoc., June 13, 1908.
(3) Berlin. klin. Woch., June 8, 1908.

of the larynx as follows: Paralysis of the vocal cords and edema of the larynx may occur in beriberi. Paralysis of the vocal cord occurs most frequently unilaterally and on the left side. It is uncertain whether it is due to inflammatory polyneuritis or to a toxic degeneration. It is easy to explain vocal cord paralysis in some cases as the result of pressure of the recurrent laryngeal following dilatation of the heart or pericardial dropsy. Since cases have been observed by him in which there was no such pressure the author is inclined to assume for such cases a peripheral degeneration of the fibers of the laryngeal nerves and muscles. In cases showing edema, since there were no inflammatory symptoms, an inflammatory origin could not be ascribed to the edema, which can only be a passive one. This conclusion is further sustained by the fact that the other edematous affections must be attributed to passive congestion. Whether we have to do simply with the effect of a weak heart or whether an affection of the blood vessels was also present, cannot at present be decided.

THE VOICE.

Last year in this volume an article on stuttering by E. W. Scripture was quoted extensively. The same author has recently given some valuable suggestions on the treatment of negligent speech.[1] All the organs involved in speech may be normal and yet correct sounds may not be produced because some part of the mechanism of control does not act with precision. This results in what may be called "negligent speech," which is different from stuttering and stammering.

Lip Defects.

Some persons use "v" for "w." For "v" the lower lip should be against the upper teeth (Fig. 21-A); for "w" the two lips are brought near each other (Fig. 21-B). To correct the fault, tell the patient to say "well, word, wind," etc.; just as he starts to say "v," press his lower lip down

---

(1) N. Y. Medical Record, Aug. 15, 1908.

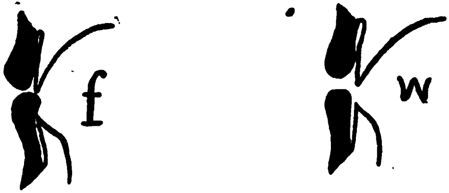


Fig. 21.

with your finger or a stick; he will be forced to say "w" instead.

TONGUE DEFECTS.

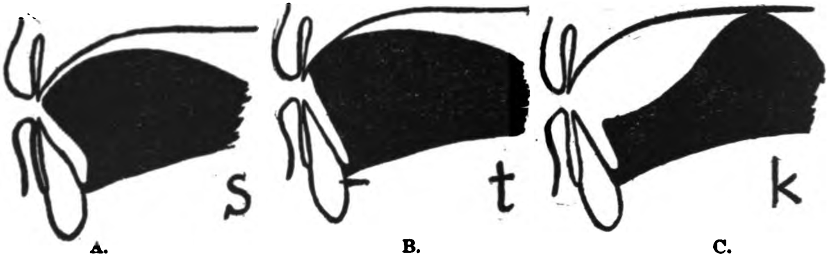
The most common are:

1. *"s-t" lisping.* The patient says "toap" for "soap," "tun" for "sun," etc. The defect is quite frequent among normal children. In saying "s" the tip of the tongue is brought against the palate (Fig. 22-A), but a small channel is left in the middle so that a jet of air is blown through. The patient merely presses his tongue a little too hard, so that it closes the channel; this is the position that produces a "t" (Fig. 22-B). The cure consists in inserting a probe just over the middle of the tongue and pressing it down as the person tries to say "t"; this makes a small channel and he is thus forced to say "s".

2. *"th-t" and "th-d" lisping.* Still more common are the children who say "tin, tree, tumb" for "thin, three thumb," and "dis, dick, dee" for "this, thick, the." For both the sounds of "th" the tongue must be put so lightly against the palate that air escapes at the sides. The defect arises from pressing the tongue too tightly; this makes a "t" or a "d" just as in the previous case. The cure consists in inserting a probe or a stick at the side of the mouth above the tongue. When the patient tries to say "t," his tongue is pressed down at the side and he is forced to say "th".

3. *"s-th" lisping.* "People thay I lithp but I don't pertheive it," remarked one young man. The tongue does not rise sufficiently at the edges in front to cut off the air at the sides while leaving a small channel in the middle. Tongue-tied people usually lisp in this way because they

must make an excessive effort to press the tongue. Such people are cured by inserting the probe to make a well defined channel as in the s-t lisping.



A. B. C.
Fig. 22.

4. *"t-th" lisping.* The patient says "wather" instead of "water," that is, he fails to close the tongue tightly across at the front. Ordinarily it is sufficient to explain to him that there are two classes of sounds called "occlusives" and "fricatives." For the occlusives the current of air passing through the mouth must be cut off at some point; for the occlusive "t" the tip of the tongue must close firmly against the palate. When it does not do so firmly, it produces the fricative sound "th".

5. *"r" defects.* The usual one is the use of "w" for "r". The cure consists in getting the tongue in the right place for "r". One method is to teach the rolled "r", which is the regular "r" in French, German, and Italian. When the person cannot get the tongue right for this, it is useful to use another sound that requires the point of the tongue against the palate. For example, he is told to repeat "sun, run, sun, run," etc., or "tun, run, tun, run," etc.

6. *Various substitutions.* "t" for "k". The child says, for example, "tandy" for "kandy," while he says "car" correctly. That is, although he is able to make the sound of "k" he replaces it by "t" in some words through pure negligence. Both "t" and "k" are occlusives, that is, the current of air is shut off entirely during the sound; for "k" this is done by the back of the tongue (Fig 22-C). While for "t" it is done by the front (Fig. 22-B). The cure consists in having the patient repeat the "k" sound

before various vowels and gradually pass over to the incorrect words, *e. g.*, "kah, kah, kah, ka-ka-kan, ka-ka-ka-kandy."

VELUM DEFECTS.

For most sounds the velum must be raised so as to cut off the nasal passage from the mouth. When this is not done, the sound is changed to a nasal; thus "b" is changed to the corresponding nasal "m", "t" to "n", etc. In mild cases a nasal indicator is used which shows when air issues from the nose.

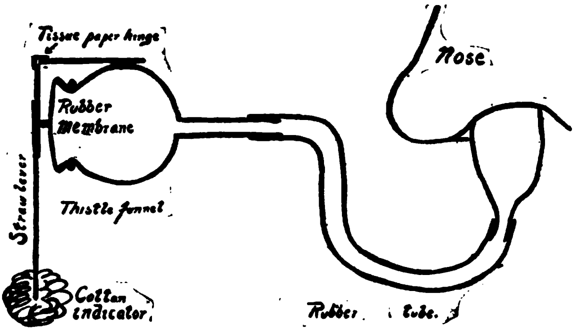


Fig. 23.

There are two convenient forms of this breath indicator which anyone can make. The one shown (Fig. 23) consists of a thistle funnel over the top of which a rubber finger cap is placed. A strip of visiting card is cut across and joined with tissue paper to make a hinge. A piece of wax holds one piece of the card to the funnel while the other one hangs in front of the rubber membrane. A drop of paste connects the hanging piece to the membrane. A light straw is fastened to the hanging piece and a bit of cotton is added at the bottom. The funnel is connected by a rubber tube to a nasal tip. When any air issues from the nose, it goes into the funnel and moves the rubber membrane; the movement is indicated by the cotton.

Another form of indicator is shown in Fig. 24. The rubber tube from the nasal tip ends in a straight glass tube whose end just touches the flame of a candle. When the air rushes from the nose, the flame flickers.

The patient must learn to say "p, b, t, d, ..., a, o, ..." without moving the indicator.

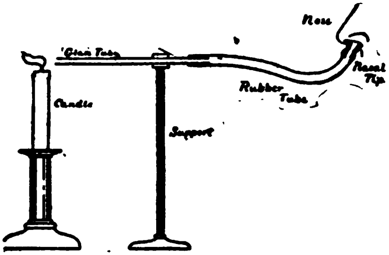


Fig. 24.

In cases where the velar action is very defective, as after operations for cleft palate, tell the patient to do things that oblige him to keep the nasal passage closed, *e. g.*, to play a mouth harmonica, or the like.

Laryngeal Defects.

1. *Laxness of the Vocal Cords.* This trouble shows itself in breathiness of the voice. It is readily detected by the ear. The defect is present in many singers and in nearly every case of abnormal speech; all epileptics and many stutterers have this laxness. It also occurs as an independent form of negligent speech. Large num-

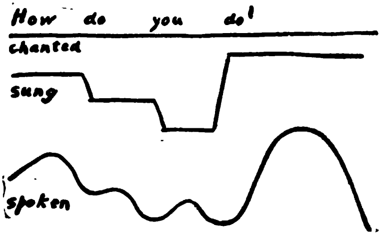


Fig. 25.

bers of the children at Randall's Island have this defect with or without other speech defect.

The defect is due to insufficient closure of the glottis by the vocal cords. In most cases the cords are bowed open at the center. The most effective treatment is staccato singing, practicing notes on the vowel "ah," imitating the speech of the megaphone man, etc.

2. *Laryngeal Monotony.* The vocal cords are stretched by several muscles. The tighter they are stretched, the higher is the pitch of the note. In singing they are stretched to a definite degree and the resulting tone is held steady. In speaking, the tone of the voice rises and falls at every instant, even in a single vowel. For example, in saying "How do you do" with a pitch indicated in the top line of Fig. 25, one speaks in a perfect monotone, or chant. If said as indicated in the second line, one sings it. When speaking it, the voice rises and falls continuously as indicated in the last line.

THE TRACHEA.

Thymic Tracheostenosis. J. Schwinn[1] reports a case of thymic asthma in a child 23 days old in which he removed the thymus with resulting cure. He gives notes of 6 other cases from the literature in which the patients were cured by operation.

Since Kopp first described enlargement of the thymus in connection with the sudden death of certain children who had been suffering from dyspnea the literature on this subject has become quite voluminous. Thymic asthma, so-called, is due no doubt in most cases to the pressure of an enlarged thymus gland on the trachea, although it is probable that the pressure on the other structures connected with the gland, as the large venous trunks, the pneumogastric nerves, etc., take part in producing the characteristic symptoms. The thymus in these cases has been usually found to be simply hypertrophic, although any other enlargement, tubercular, syphilitic, inflamma-

---

(1) Jour. Am. Med. Assoc., June 20, 1908.

tory, or even simple congestive, is liable to produce the symptoms.

The difficulty naturally increases with the size of the organ and also with its position. Where the gland does not reach clear up into the sternal notch the trachea is less liable to be compressed; as the anteroposterior diameter of the upper aperture of the chest cavity is only, on an average, 1 to 2 centimeters, it is evident that after the passage of all the structures enumerated above as passing through this opening there is very little room left for an enlarged thymus. Moreover, this aperture is formed by a ring of bones and cartilage which does not yield even on forcible traction.

In well developed cases of thymic asthma we find the symptoms of a stenosis of the air tract somewhere between the larynx and the bifurcation of the trachea; inspiratory and expiratory stridor, as a more or less audible whistling respiration; retraction of the supraclavicular, infraclavicular, and intercostal spaces during inspiration; inspiratory dilation of the nostrils, and more or less cyanosis and restlessness. Most any time these symptoms may assume a most dangerous character, the respiration becoming extremely labored, the patient becoming blue or almost black. Consciousness is lost, convulsions may set in and, with a rapid, weak pulse, death may follow in the course of a few minutes.

Potts reports 4 cases where children died with the symptoms of suffocation within 2 minutes after the insertion of a tongue-depressor. A child may show very slight symptoms of difficult respiration, and suddenly in the midst of a crying spell or during an exciting play become cyanosed and perish with symptoms of suffocation. Inspection and palpation are as a rule negative in thymic enlargement, except where the gland is quite large and forms a visible and palpable swelling in the suprasternal notch. Percussion often brings out an abnormal dulness over the upper end of the sternum, while auscultation may show diminished breathing and abnormal tracheal sounds. The voice is generally unchanged, except that it may be weak. The fact that in a case of obstruction to respiration the usual intubation gives no relief, while the intubation with the use of a long tube removes the stenotic symptoms, would point to the thymus as the cause of the obstruction.

Operation should be performed as soon as a diagnosis is made, the radiographic method being the most reliable of our diagnostic means. A tracheotomy should be provided for in every case, but avoided if possible on account of the danger of infecting the mediastinum. The upper chest aperture should be temporarily enlarged by the splitting of the sternum, if during the operation the dyspnea is increasing at all; in this way it will be possible to avoid tracheotomy in a number of cases. General anesthesia should be used, as it is very difficult to operate on a struggling child.

THE BRONCHI.

Bronchoscopy. The bronchoscope is finding other uses than the detection and removal of foreign bodies. As in other localities certain diseases of the trachea and bronchi may be quickly cured by direct local applications when indirect treatment has failed. R. H. Johnston[1] presents several cases exemplifying the value of local treatment in tracheal and bronchial diseases. The remedies used cannot be used in as great strength as in the upper respiratory tract.

The solutions generally applied are nitrate of silver (two to ten per cent. solutions) and argyrol (twenty per cent. solutions); with these drugs can be accomplished all that it is possible to do except in syphilitic lesions in which chromic acid (two per cent. solution) will probably do as much good as in such ulcers seated higher up. In examining pathologic conditions in the trachea and bronchi, one is struck with the tendency of inflammations to limit themselves to certain areas. We may for instance, find the disease in the trachea with no extension to the bronchi or vice versa; or we may see a circumscribed tracheal inflammation which is often located about two inches below the larynx and which sometimes follows "Grip" and gives rise to an obstinate cough.

---

(1) Va. Med. Semi-Monthly, Feb. 12, 1909.

The author's cases were as follows: Miss E. W., a troublesome cough of about five month's duration. In September, 1907, she contracted a cold which terminated in the cough She consulted her family physician, who gave her the usual remedies with little or no benefit. Examination of the sputum was negative. In December she left the city and visited a health resort; during her absence the cough seemed to improve but on her return immediately became worse again. The paroxysms, which came on at night, interfered with sleep. Under local anesthesia the bronchoscope was passed with the patient in the sitting position. The larynx and upper part of the trachea appeared normal; approaching gradually the bifurcation and about two inches above it, thick, tenacious muco-pus was encountered. Upon wiping out the secretion an area of local inflammation was found. The mucous membrane was reddened and somewhat swollen and in the center of the diseased area a small, well defined ulcer with distinct edges could be seen.

The bronchi were slightly reddened but otherwise showed nothing abnormal. The patient had located a "sore spot" in the chest at about the bifurcation. Treatment was begun at the first sitting with the direct application of nitrate of silver (two per cent. solution). The immediate effect of each treatment was to increase the cough for several days, after which improvement was noticed. The applications were repeated every week or ten days, gradually increasing the strength of the solution, until six treatments had been given. At the end of this time the cough had improved so much that further bronchoscopic treatment was considered unnecessary. At the fifth sitting the ulcer had practically healed.

Miss M. F., cough and a sensation of tracheal soreness of nearly a year's duration. Expectoration was slight but the cough made the soreness more pronounced. The patient had been treated through the winter with various cough remedies and sprays locally with no benefit. She was greatly discouraged and the fear of tuberculosis was ever before her. A bronchoscopic examination showed thick, tenacious secretion clinging to the tracheal walls; after its removal the mucous membrane appeared red and slightly thickened. The bronchi were normal. The diagnosis of subacute tracheitis was made and treatment with nitrate of silver instituted. The inflammation was treated directly through the bronchoscope eight times. The patient left the city well and has remained so.

Mr. C. E., for several years, had had attacks of cough and soreness in the trachea which he located about two inches below the cricoid cartilage. The cough was dry with the occasional expectoration of a small plug of thick, tenacious mucus He had formerly a fine tenor voice but had been forced to give up singing from the inclination to cough during the midst of a song. Examination with the direct laryngoscope was successful but the bronchoscope could not be passed because the patient could not extend the head sufficiently. Though no lesion could be seen through the laryngoscope, it was decided to make applications of nitrate of silver to the tracheal mucous membrane. After several treatments improvement was noted; the patient could sing without interruption and the soreness disappeared.

The author concludes that:

With practice the introduction of a rigid, straight tube into the trachea and bronchi is not difficult.

The bronchoscope can be introduced in nearly every adult case under local anesthesia.

The hypodermic injection of morphia and atropia is a great help for the successful manipulation of the tubes and for drying up secretion.

The mucous membrane of the trachea and bronchi is seen as clearly as is the mucous membrane of the throat with the head mirror,

THE ESOPHAGUS.

Mouth of the Esophagus. From interesting anatomic, physiologic and clinical observations, G. Killian[1] concludes that the esophagus is normally closed during the intervals of deglutition, the larynx resting above it and pushing the lower part of the pharynx backward against the spinal column. The closure of the esophagus, however, is not

---

(1) Annales des Maladies de l'oreille, du larynx, etc., July, 1908.

due simply to the pressure of the larynx, for if the larynx be pulled forward by a probe either introduced through the glottis of the cocainized larynx or through a tracheotomy wound, the walls of the lower part of the pharynx are seen by means of the esophagoscope to separate from each other, but the opening of the esophagus remains closed. If the esophagoscope be introduced to this point an obstruction to its further progress will be felt and this obstruction is evident for about a centimeter. Below this point the passage is free. The esophagus is separated from the pharynx by a sort of mouth closed by circular muscular fibers which embrace the cricoid cartilage in such a way that their contraction forms a sort of lip which is semicircular with the concavity forward and which is more or less thick according to the degree of contraction of the muscle. The mouth of the esophagus is closed except during vomiting and deglutition.

Clinically the mouth of the esophagus may be subject to spasm, giving rise to sensations like the globus hystericus and to pain in this region. Foreign bodies are lodged there because the mouth contracts and refuses to allow them to pass if of too great a size. The region is especially liable to injury and hence to the development of ulcers and malignant tumors. Finally Killian thinks that the existence of this arrangement throws a great light on the pathogenesis of pulsion diverticula of the lower part of the pharynx and he believes that with few exceptions these diverticula have their origin in a spasm of the mouth of the esophagus.

HAY FEVER.

E. S. Yonge[1] has tried *resection of the nasal nerve for intractable hay fever* and paroxysmal coryza and reports perfect success, the patients being entirely relieved. While the sensitiveness of the septum was notably diminished there was no definite anesthesia either of this region or of the conjunctiva or skin. In operating, the nerve was reached by an incision at the inner edge of the orbit,

---

(1) **Lancet, June 13, 1908.**

commencing just above the inner canthus and extending upwards and slightly outwards for about two-thirds of an inch. The cellular tissue having been cleared from the inner upper wall of the orbit by means of a blunt dissector and the nerve located at the anterior ethmoidal foramen, the latter was separated from the artery and divided close to the foramen, about a quarter of an inch of the nerve being removed. Horsehair sutures were inserted and the wound was dressed with gauze and collodion. The stitches were removed on the fourth day.

Yonge offers this procedure only suggestively and states that his report is only preliminary to a more definite one when more time shall have elapsed after the operations and a larger number of operations performed.

Of course *Bier's congestion treatment* would be tried in hay fever and F. Mueller[1] reports a case in which such treatment was applied with much relief to the patient.

O. J. Stein[2] believes this disorder represents a *hyperesthesia of the trigeminal nerves,* created by the instability of the body fluids and manifesting itself as a rhinitis with various reflex phenomena. He thinks the ordinary view that the hyperesthetic condition of the nose is created by a general neurotic temperament is incorrect, but that the general neurotic manifestation, so evident in many of these sufferers, is the result and not the cause of the disorder.

With the susceptibility established, the second element, in the form of an external excitant, like dust, pollen, a draught, bright light, cold, pressure spots within the nose, etc., readily completes the circuit and the disorder is manifest.

The first step in the treatment of the case consists in a careful study of the individual to discover the fault in the body fluids and the application of measures to restore the normal condition. Eliminants will probably be necessary and the use of antacids will be needed if there is an acidosis present.

For the local disturbance, correction of any disturbing contact points in the nose will be advisable. The special

---

(1) Therap. Monatshefte, April, 1908.
(2) Laryngoscope, September, 1908.

treatment, however, which Stein advocates is the intraneural injection of alcohol to obtund the irritability of the end filaments of the trigeminal in the nose. By injecting the nasal nerve at its point of entrance into the nose both the internal and external filaments are deprived of their hypersensibility. To inject the nasal nerve a needle 2½ inches long is required, the point being inserted at the anterior superior angle of the nasal cavity, against the inner surface of the nasal bone, near its distal end. The posterior group of nerves is reached by a needle 3¼ inches long with a curve of 45 degrees near its end. This is inserted in the neighborhood of the spheno-palatine foramen, which is located in the spheno-ethmoidal fossa just above and to the outer side of the posterior end of the middle turbinate. Both nostrils are injected, requiring 4 injections. In some cases it may be necessary to inject only the anterior groups. The author has used both dilute and pure alcohol for the injections, a few drops in each injection. Cocain is used for local anesthesia and no serious ill results have been encountered. The injections may have to be repeated from 1 to 4 times during the season. Stein's report is only preliminary, but he considers his results encouraging.

Ralph Grace[1] claims success by treatment with *nargol.* He first tried treatment with silver nitrate solution, beginning with a strength of one-tenth of 1 per cent. and gradually increasing. While the results with nitrate were very satisfactory the painful reaction from the applications led him to seek an agent which would not cause such pain. He found such an agent in the silver nucleid called nargol.

He begins with a 2 per cent. solution of the nargol, making a thorough application to the congested mucous membrane up to the entrance to the antrum and using a very thin applicator. In extremely sensitive cases he uses cocain first. He does not state how much he increases the strength of the nargol. By. treatment every third day the patient's condition is much improved and practical cure for the season is obtained after a few treatments.

---

(1) Therapeutic Gazette, August, 1908.

F. C. Todd[1] has found *pollantin* of real value in treatment. He thinks the best results are secured by the use of large quantities of the powder. The patient who is unable to use much on account of the irritating effects will not receive so much benefit as the one who can use it more liberally. He mentions one very bad case in which the patient was able to remain at home comfortably by using 25 tubes of pollantin during the season. He cautions against the use of adrenalin on account of the reactionary effects.

For those patients who are obliged to remain in the city during the hay-fever season he prescribes the following plan, which he has used in his own case with great satisfaction:

First, avoid using adrenalin, cocain or any of those preparations in the nose. Stay down town during business hours, for there is no vegetation down town and consequently little pollen, and have at home an "immune" room prepared in which there is no pollen and where none is allowed to enter. The superfluous furniture, curtains, etc., are removed, the floor and walls wiped thoroughly, the bedding shaken, and, in order to secure fresh air, cloth having a sufficiently close mesh to prevent the entrance of pollen but to allow the entrance of as much air as possible, is tacked over the open windows. The door is closed day and night, and upon going to bed the patient undresses and leaves his clothing in another room. If an attack has been instigated as a consequence of passing through the streets, pollantin should be used. It will be found to be very effective under these conditions because there is no opportunity for new poison to enter.

This room will be found to be a heaven for the hay-feverite, and he will sleep normally. It is the disturbed rest which makes the suffering so hard to bear. Furthermore, if the patient during his sleeping hours is relieved of this suffering he will have more resistance to bear the disease the remainder of the day, and the disease will depart more rapidly in the fall, leaving him in a better condition.

---

(1) Jour. Minn. State Med. Assoc., Aug. 15, 1908.

MISCELLANEOUS.

Infections From Upper Air Tract. After reviewing quite fully the recent literature on the upper air tract in relation to rheumatism, gout and diabetes, E. Mayer[1] arrives at the following conclusions: Infection in rheumatism and gout enters by way of the mouth, the opinion of the majority being that the chief point of entrance is the tonsil.

Rheumatism may affect as such the nose, pharynx and larynx.

Gout affects the larynx, but most frequently the nasal mucosa. Diabetes may be discovered very easily by painstaking examinations in certain laryngeal cases, a late symptom being furunculosis of the larynx and possible perichondritis. Fatal ulcerations in the throat occasionally manifest themselves in diabetes.

Sensory Polyneuritis Following Influenza. E. Escat[2] classifies the cases of neuritis following influenzal attacks, especially those of the nerves of the nose, larynx, pharynx, and ear. The condition affects the mucous membrane and attacks the finest ramifications of the nerves of special and ordinary sensation. It is in the beginning so closely associated with catarrh that it is impossible to separate the two affections and distinguish the symptoms due to each. It lasts longer than the catarrh and after the catarrhal manifestations have subsided the distinctive symptoms of the neuritis remain. They are to be distinguished from symptoms of simple neuropathic origin, as the treatment must be in some cases radically different. This affection of the nerves of ordinary sensation shows itself generally by hyperesthesia, while the nerves of special sense are anesthetic or hypesthetic. With the hyperesthesia is frequently associated a condition of dysthesia and to the hypesthesia various paresthesias are added. The inflammation of the nerve is usually benign and temporary. The symptoms are very various, but the affection should be regarded as a unit and its underlying cause should be kept in mind.

---

(1) Laryngoscope, August, 1908.
(2) Annales des maladies de l'oreille, du larynx., etc., May, 1908.

From the affection of the olfactory nerve anosmia is frequently seen. Parosmias may occur and rarely hyperosmia. Supraorbital and suborbital neuralgias show the affection of the first division of the trigeminal. Neuritis of the external frontal nerve may occur. The mucous membrane of the nose is affected with a spasmodic rhinitis which is sometimes painful. This affection is intermittent, but the symptoms do not disappear so completely in the intervals as in rhinitis of purely neuropathic origin. Asthma may result. Pharyngodynia is sometimes very severe and is sometimes accompanied by a retro-pharyngeal dysthesia which gives the impression that there is a swelling of the mucosa or a foreign body in the nasopharynx, but rhinoscopic examination fails to confirm this idea and no lesion may be observed other than a slight reddening.

Loss of taste may be occasioned by the neuritis of the gustatory or the disturbance may take the form of various perversions of taste—para or hypergusia. Pharyngeal paresthesias may take the form of nausea or tenesmus of the pharynx. This has received a special name as a distinct syndrome, being called pharyngo-paresthesie grippale. Epiglottitis may occur and a hyperesthesia of the region at the base of the tongue may develop. Dysthesia in the form of a feeling of pricking or burning in the deeper tissues of the throat with attacks of cough. Neuralgia of the larynx is found as one of the symptoms. As expressions of affection of the lower laryngeal nerves we may have paretic dysphonia and trachealgia. The nerves connected with the ear may be affected, giving otalgia and deafness. As a rule the deep-seated nerves unconnected with mucous membranes are not affected, so that odontalgia is not observed.

Treatment. This is to be divided into causal and symptomatic. The causal is the same as the general treatment of influenza. Escat suggests the use of the cacodylate of guaiacol, which has obtained a reputation as a specific remedy for grippe, given hypodermically in doses of 0.05 gm. (¾ grain). If quinin is used he recommends that the sedative action of the hydrobromate or valerate be obtained. For the elimination of toxins the iodid of caffein is appropriate. The olfactory neuritis may be treated by insufflations of cacodylate of guaiacol and later the application of iodized glycerin after cocainization to the olfactory cleft. For the spasmodic rhinitis the use of strychnin and atropin is recommended. In the chronic stage it may be desirable to remove a part of the turbinated body or cauterization may be resorted to. For pharyngeal paresthesia gargles of an iodized solution may be prescribed. In these cases thermal sodium sulphate or calcium sulphate waters, which would be out of place for simple neuropathic cases, is indicated. Hyperesthesia of the larynx will be relieved by the addition to the ordinary antispasmodic remedies of the following measures: 1. The application of dry cups to the prelaryngeal region after the method of Bier, iodid of methyl blisters, or the actual cautery. 2. Atomization of solutions of cocain or alypin. 3. Pencilling the epiglottis or laryngeal vestibule with a mixture containing menthol, phenol, and cocain. 4. In case of very obstinate cough prelaryngeal injection of 1 per cent. cocain solution according to the method of Frey may be used. 5. By the use of a galvanic current for 5 minutes. Trachealgia is treated by strong revulsive measures and by intratracheal injections of cacodylate of guaiacol.

Direct Radiotherapy of the Upper Air Passages. Mader[1] of Munich treats malignant tumors of the upper air passages by x-rays generated *in situ* by a special apparatus which contains the tube for the generation of the rays in a special holder prolonged so that it can be introduced into the nasopharynx surrounded by a screen so that the directions of the rays can be exactly controlled. The rays are powerful enough so that they will penetrate the forearm through the clothing. The pharynx is swabbed with cocain at the first sittings, but later ones are supported without anesthetic. The patient holds his tongue with his hand. Mader regards this method as much superior to that of Helot and Payenneville, who introduce a glass tube shielded by one of lead and conduct the x-rays through it from the outside. He claims that his method is neither dangerous nor painful, while Helot and Payenne-

---

(1) Arch. Internat. de laryngol., d'otol., et de rhinol., January-February, 1909.

ville were compelled to resort to general anesthesia in applying their apparatus.

Properly applied, the rays are capable of rendering good service in the treatment of cancer, but the results have not been very brilliant; they would perhaps have been better if the technic had been better. Mader, while admitting that at the present time it is impossible to lay down hard and fast rules, makes the following classification of cases: 1. All cases whose strength is such that they are likely to bear an extensive operative procedure and in which it is certain that the growth with affected glands and an area of sound tissue can be completely removed should be operated on. 2. Radiotherapy is permissible in all cases in which the results of surgical intervention are doubtful, but it should be undertaken only after having informed the patient as far as possible of the nature and prospects of the case and having given him the choice between surgical operation and radiation. 3. Radiotherapy is indicated in all cases in which the patient positively refuses operation and in those in which *a priori* it seems probable that an operation would be unsuccessful; also in cases in which a postoperative relapse has occurred.

Inhalation Therapy. T. Heryng[1] shows that by means of thermo-regulators the field of practical therapeutics has been increased in two directions. 1. We can raise the temperature of the spray to 70 C. and lower it to 10 C. 2. We have at our disposal gaseous mixtures capable of regulation and saturated with steam which make a local therapy of the lungs possible and permit the establishment of a thermotherapy in the true sense of the word. The author shows by a number of examples that inhaled medicaments reach the blood and produce their effects more rapidly and in smaller doses than when taken by the mouth. Inhalation therapy is applicable not only to acute and chronic diseases of the upper air passages, but it is also indicated in chronic tuberculosis of the lungs, not to destroy the bacillus, but to treat secondary infection more efficaciously than heretofore, to liquefy secretions, allay cough, diminish congestion and act directly on the toxins of tuberculosis and the pyogenic cocci after absorption into

---

(1) Klinisch-Therap. Woch., Aug. 3, 1908.

the blood. The method is contraindicated in cases where there is a tendency to hemorrhages, marked cardiac weakness, painful inspiration, marked lack of breath, or distressing paroxysms of coughing. Inhalation treatment should first be tried in sanatoria where careful control can be exercised. In syphilis the method has given good results in many cases. It is also serviceable in asthma and arteriosclerosis and should find application in chronic rheumatism, chlorosis and anemia.

Therapy. F. C. Ewing[1] believes that the usual therapy of the mucous membrane is too irritating. A spray pressure of over 10 pounds is an irritant to the nose and should not be used. Menthol, he believes, is too much of an irritant in any of the strengths ordinarily used to be helpful in acute inflammations. He has practically quit using it and depends upon ordinary yellow vaseline containing some eucalyptol, often using the vaseline alone when there is excess of inflammation.

The vaseline, containing an active therapeutic principle by reason of its petroleum origin, is also soothing and protective and more adherent than any other product that can be sprayed. Melted in a Rumbold atomizer, over a Bunsen burner, and sprayed into the nose, it forms a thick salve-coating, which, on the surface of the pharynx or nasopharynx, is more adherent than any other vehicle. In the passages and crevices of the nose it will remain for hours undislodged if no active effort, such as blowing, is made to remove it. Various medicaments may be suspended in it, in strength adapted to the part to be treated or the special susceptibility of the patient. The Rumbold sprays are not to be confused with the hand-ball atomizer. Heavy vaseline is not adaptable to the small atomizer, as this soon becomes clogged, but, through the Rumbold apparatus, a heavy spray is sent in, which congeals at the temperature of the body, and forms a coating of protective salve, maintaining a relatively constant contact of the suspended medicament with the surface for a varying length of time. Thus by its purely mechanical character it is curative in that it protects the mucous membrane from cold air and dust in harmony with our idea of rest

---

(1) Jour. Missouri State Med. Assoc., Vol. V, No. 1.

and relaxation. These remarks apply particularly to the nasal passages, the more sensitive surfaces, and not to the throat cavity, pharynx, or postnasal space, which in certain chronic conditions may require active stimulation and the application of such remedies as nitra-silver and strong astringents in aqueous solutions applied with a swab.

Adrenalin. F. E. Hopkins[1] takes up the case as it has been presented against and for adrenalin as an agent causing arteriosclerosis and finds that there is little reliable evidence that it causes any changes in the blood vessels. He quotes from Miles and Johnstone, whose results showed that of 61 rabbits injected with different amounts of adrenalin and for varying periods, 27.86 per cent. showed lesions of the large vessels on postmortem examination. The amount injected seemed to have little to do with the results, as some of those receiving the smallest amounts showed the sclerosis, while others receiving much larger amounts showed no changes at all. Furthermore, of 58 "normal" rabbits taken from the same sources and kept under the same conditions as those experimented on, 34.48 per cent. were found to have arterial lesions of exactly the same character as the animals treated. Hopkins also quotes from an exhaustive paper by Adler, who concludes that the changes found in rabbits' blood vessels after using adrenalin probably existed before the adrenalin was used.

He cites a case reported by Harlow Brooks in which a woman suffering from asthma received hypodermic injections of adrenalin during a period of 3 years amounting to a total of 44 ounces of the usual 1-1000 solution. The remedy was used because nothing else gave any relief. Her death occurred from a cause that could not be attributed to adrenalin and examination of her arteries revealed only the changes in vessel walls to be expected at her age. The author concludes that there is no good reason why adrenalin may not be used to a reasonable extent in any case where needed.

Trichloracetic Acid. W. H. Fitzgerald[1] is quite enthusiastic in describing the uses of trichloracetic acid.

---

(1) Ann. of Otol., Rhinol. and Laryngol., December, 1908.
(2) Jour. Am. Med. Assoc., April 12, 1908.

He says: "Numerous cases in my hospital and private practice treated with strongly concentrated solutions of trichloracetic acid prove to my satisfaction that we have in this preparation almost a specific for the great majority of diseases of the mouth, throat and cervical lymphatics.

"In postoperative treatment of mouth and throat conditions trichloracetic acid prevents infections and secondary hemorrhage and enables the patient to swallow solid food without the slightest difficulty almost immediately following a painstaking application over comparatively dry raw areas. This is likewise true regarding cauterized surfaces and practically all diseases of mouth and throat, and often one treatment will suffice.

"Acute pain and swelling of cervical lymphatics disappears speedily (frequently within a few minutes) through applications within the faucial tonsil and about its base on the affected side. The entire tonsil may be covered if necessary and several applications may be made during one treatment. It is well to use the solution sparingly, however, although the only unpleasant symptoms likely to arise will be a slight dryness, preceded by a trivial stinging over the area treated. Preliminary cocainization, except perhaps in the nostrils, is seldom necessary. A strongly concentrated solution, as is well known, alone or in conjunction with the actual cautery (inflammatory extensions are thus prevented), is most useful in the treatment of various infections of the nose and nasopharynx.

"Dentists will find trichloracetic acid indispensable in diseases and postoperative treatment of the gums. As a disinfectant and deodorant in dentistry it will be found most efficacious. Trichloracetic acid will be found equally useful in the treatment of diseases of the mucous membrane and lymphatics elsewhere throughout the body. Chemists tell us it has no anodyne properties, but my experience, I believe, proves it to be one of the most remarkable of anodynes."

In regard to the drug the *Physicians' Manual of the U. S. Pharmacopeia and National Formulary* says:

"Uses: Chiefly as a chemical reagent; astringent escharotic, hemostatic; to remove warts and other skin blemishes, in 10 per cent. water solution; astringent or hemostatic, 1 to 3 per cent. solution; must be used with care."

The *British Pharmaceutical Codex* says:

"Trichloracetic acid is applied as a caustic to the skin, and is less painful than nitric acid; it has also been employed in strong solutions as a caustic in chronic pharyngitis. Weak solutions, containing 1 per cent. or less, have a powerful disinfectant action, and such solutions may be applied to wounds and ulcers, or used in erysipelas and gonorrhea, without causing irritation. It is rarely taken internally, but from 2 to 2.5 decigrams (3 or 4 grains) well diluted have been recommended in gastritis. Liquefied trichloracetic acid is a liquid prepared by the addition of 10 per cent. of water to the crystalline acid."

Cocain. J. Leshure[1] advocates the use of strong cocain solutions in operative work on the interior of the nose, believing that there is less absorption from a 55 per cent. solution than from one of 10 per cent. His strong solution is made by dissolving 1 gram (15 grains) of cocain hydrochlorid in one c.c. (15 minims) of 1-1000 adrenalin solution. This gives a 55 per cent. by volume solution of cocain and a specific gravity of 1,110. As the specific gravity of the blood is only 1,025 to 1,032, such a solution would be absorbed much more slowly than one of less density. Such a strong solution is to be brushed over the mucous membrane carefully and is not intended to be used on cotton pledgets packed against the surface. Due allowance must be made for the dilution of the solution by the nasal secretion.

The author thinks that such a strong solution is better than the application of the pure crystals, as the amount used can be better determined and the crystals are more likely to be drawn in by the inspiratory current.

---

(1) N. Y. Med. Jour., Feb. 6, 1909.

INDEX.

Abscess,
  Bezold's, 203.
  brain, drainage of, 215.
  extradural, 205.
  localization of otitic brain, 230.
  peritonsillar, 310.
Acid, trichloracetic, 351.
Acoin in an oil collyrium, 158.
Adenectomy, 299.
Adenoids and eye troubles, 134.
Adenoids in causation of ear disease, 179.
Adnephrin, 161.
Adrenalin with cocain in extraction of cataract, 63.
Adrin, 161, 162.
Albargin, 161, 163.
Albinos, injection of India ink in the eyes of, 158.
Alcohol injections in blepharospasm and painful tic, 113.
Alypin, 161, 163.
Amblyopia from tobacco, 99.
Ametropia and its treatment, 16.
  monocular correction of, 24.
Analgesia, nasal, 177.
Anesthesia,
  local, for thyrotomy, 325.
  of the orbit, 116.
Anesthesia treatment of laryngeal tuberculosis, 317.
Angioma of the antrum, 285.
  of the tarsal conjuntiva, 144.
Antidiphtheritic serum in eye infections, 155.
Antistaphylococcic vaccine, 155.
Antrum, the, 283.
  angioma of, 285.
  empyema of, 283.
  from dental trouble, 283.
  treatment, 284.
Argentamine, 161, 165.
Argonin, 161, 165.
Argyrol, 161.
Argyrol argyrosis, 106.
Argyrosis from argyrol, 106.
Arteriosclerosis with retinal hemorrhages, 133.
Asthenopia, treatment of, 24.
Astigmatic charts, Verhoeff's, 17.
Atoxyl,
  dangers of, 160.
  in eye diseases, 159.
Atropin and homatropin compared, 22.
Autoplasty, palpebral, 41.

Bacteria in the larynx, 311.
Bacteriology of eye, 33.
Beriberi, laryngeal lesions in, 331.
Beta-eucaine hydrochloride, 161.
Beta-eucaine lactate, 167.
Bezold's abscess, 203.
Bier's congestion treatment for hay fever, 343.
Blennorrhea neonatorum, prophylaxis and treatment, 32.
Blepharospasm treated by alcohol injections, 113.
Blind, magazine for, 29.
Blindness following injection of protargol into lacrimal sac, 106.
  hysterical and simulated, 79.
  from wood alcohol, 99.
Blood clot method following Schwartze operation, 204.
Blueblindness caused by yellow color of the eyes, 105.
Brain abscesses, drainage, 215.
  localization of otitic, 230.

Brain and sinus, 205.
Bronchi, the, 339.
Bronchoscopy, 339.
Burns of eyelids, early transplantation in, 40.

Calmette opththalmo-reaction, 11.
Cancer of the nose, 294.
Capsulotomy, complete peripheral, 152.
Cardiovascular disease with ear symptoms, 238.
Cataract,
  adrenalin with cocain in extraction, 63.
  close confinement after operation, 69.
  collapse of sclerotic during extraction, 66.
  congenital, 58.
  extraction, lid elevator for, 151.
  extraction, 100 cases of, 65.
  extraction, effect of pressure in healing incision, 66.
  extraction of in the capsule, 63.
  incipient, potassium iodid in, 59.
  opacification of cornea after extraction, 69.
  operations for maturation of immature senile, 60.
  operations for secondary, 70.
  propulsive hemorrhage after extraction, 67.
Catarrh from cold, 263.
  of middle ear, pneumo-massage in, 181.
Charts, Verhoeff's astigmatic, 17.
Children, eyestrain in education of, 30.
  nasopharyngitis in, 297.
  the eyes of, 31.
Chloretone, 161, 166.
Choked disc in brain tumor, 86.
  operations, 85.
Cocain, 353.
  with adrenalin in cataract extraction, 63.
Cochlea involved after middle ear disease, 228.
Cold as a cause of catarrh, 263.
Collargol, 161, 166.
  ointment, 161, 166.
Color sense, disturbance in internal diseases, 104.
Conjunctiva, the, 42.
  angioma of, 144.
Conjunctivitis, 43.
  etiology and treatment of chronic, 46.
  from ophthalmo-reaction, 12.
  Morax-Axenfeld's, 44.
  Parinaud's, 43.
  phylactenular, associated with diplo-bacillary, 48.
  infant delivered by Cesarean section, 43.
  purulent in an
  vernal, with corneal changes, 47.
Cornea, herpes of, 54.
  instrument for cauterizing corneal ulcers, 151.
  opacification of after cataract extraction, 69.
  zonular opacity of, 55.
  wounds of protected by iris, 127.
Critchett's operation, 56.
Curettement of lateral sinus, 221.
Cyanosis retinæ, 95.
Cyclodialysis and its influence on increased intraocular tension, 119.
Cycloplegics in refraction work, 21.

Dacryocystitis in the newborn, 74.
Deafness, catarrhal, 177.
  nasal analgesia in, 177.
  following mumps, 226.
  occurring during osteomyelitis, 234.
  from perforated membrane, treatment, 195.
  from tonsil trouble, 308.
  treatment, 178.

Death in cases of paralysis of recurrent laryngeal, 313.
  from tonsillotomy, 307.
Descemet's membrane, multiple isolated ruptures of during birth, 122.
  membrane, rupture of, 50.
Diaphanoscopy in glaucoma, 153.
Dionin, the deep action of, 158.
Diphtheria of tonsil, 298.
Diplopia from head injury, 129.
  monocular, 25.
Disc, choked, operations, 85.
Dysmenorrhea, nasal, 293.

Ear, the, 177.
  internal, 221.
  middle, 177.
  relation of nasopharynx to, 182.
Ear disease from adenoids, 179.
Ear symptoms of cardiovascular disease, 238.
Ears, running, 182.
Ectropion, cicatrical, operation for, 40.
Empyema of antrum, 283.
  of accessory sinuses, 282.
Epilepsy and ophthalmic migraine, 132.
Epinephrine, 161.
Epistaxis, 292.
Epithelioma of the palate, 301.
Esophagus, the, 341.
  mouth of, 341.
Ethyl-morphine hydrochloride, 162.
Eucain, 167.
Eumydrin, 162, 167.
Euphthalmin, 162.
Evolution of the tonsil, 301.
Eye, bacteriology of, 33.
  examination of, 9.
  fundus, inspection by transillumination, 10.
  inflammation of from sinus disease, 109.
  localization of foreign bodies in, 125.
  pieces of steel in, 124.
  staphylococcus infection of, 34.
  symptoms and diseases accompanying adenoids, 134.
  syphilis of, 15, 35, 143.
  typhoid reaction in, 15.
  effect of ultra-violet rays on, 26.
Eye complications of meningitis, 33.
  complications of pregnancy, 134.
  diseases from tuberculosis, 139.
  diseases and the accessory sinuses, 136.
  infections, antidiphtheritic serum in, 155.
  injuries, 122.
  injuries from cheap hammers, 123.
  injury causing tetanus, 128.
  instruments and appliances, 147.
  muscles, the, 107.
  remedies, favorite, 160.
  troubles from diseases of the accessory sinuses, 109.
  tumors, 144.
  therapeutics, 153.
Eyeball, plea for more favorable prognosis in penetrating wounds of, 127.
Eyelids, the, 39.
  burns of, 40.
Eyestrain in the education of children, 30.
Eyes of school children, 31.
  of plants, 10.

Fibroma of the orbit, 146.
Fibrolysin, 162, 168.
Filter cicatrices, operation to insure, 119.
Fluid in the healthy and diseased conjunctival sac, 42.
Fluorescein, 162.

Gangrene of the pharynx, 299.
Gastrointestinal disturbance in otitis media, 185.
Glands, adenectomy, 299.

Glasses to protect from ultra-violet rays, 27.
Glaucoma, 117.
  as a sequel to leucoma adherens, 117.
  diaphanoscopy in, 153.
  simplex, value of treatment in, 118.
Glioma of the retina, 146.
Glycerin as an adjuvant to silver nitrate, 156.
Goiter, exophthalmic, diagnosis, 136.
Gonorrheal pus in treatment of pannus, 55.

Hammers, cheap, causing eye injury, 123.
Hay fever, 342.
  Bier's congestion treatment, 343.
  etiology, 343.
  nargol in, 344.
  pollantin in, 345.
  resection of nasal nerve for, 342.
Headache from nonsuppurative sinuitis, 286.
  from sinus disease, 281.
Head injury, causing diplopia, 129.
Hemorrhage from tonsillectomy, 308.
Hemorrhages in arteriosclerosis, 133.
  intraocular, 72.
Heath operation, the, 199.
Herpes, febrile, of cornea, treatment, 54.
History of hyperopia, 23.
Holacaine hydrochloride, 162.
Homatropin and atropin compared, 22.
Hydrocephalus, acute internal secondary to infected labyrinth, 210.
Hyoscin in refraction work, 21.
Hyperopia, history of, 23.
Hypopion-ulcer, staphylococcic vaccine for, 155.
Hysterical and simulated blindness, 79.

Ichthargan, 162, 168.
India ink injections in the eyes of Albinos, 158.
Indians, refractions of, 16.
Infants, spectacle frames for, 26.
Infections from upper air tract, 346.
Influenza causing sensory polyneuritis, 346.
Inhalation therapy, 349.
Inhaler for laryngeal tuberculosis, 315.
Injuries of the eye, 122.
Instruments and appliances for eye work, 147.
Intubation followed by laryngitis, 312.
Iridotomy, a new knife for, 151.
Iris as protector in corneal wounds, 127.
  tuberculosis of, 72.
  tumor of, 22 years old, 145.
Iritis, gonorrheal, 70.
  tuberculous, with Mikulicz disease, 71.
Iron in the eye, 126.

Jequiritol in diseases of the conjunctiva and cornea, 156.
Jequirity in trachoma, 49.

Keratoplasty, 57.
Kerectomy, modified Critchett operation, 56.
Keratitis, interstitial, in acquired syphilis, 51.
  some etiologic factors in, 52.
  neuropathic, bacteriology of, 38.
Killian operation, 287.
  Jansen's modification, 287.
Knife, a new iridotomy, 151.
  a new pterygium, 150.
Knife guard in tarsal subsection, 150.

Labyrinth, infection of followed by acute hydrocephalus, 210.

  involved after middle ear disease, 228.
  operative destruction of as cure for vertigo and tinnitus, 237.
Lacrimal apparatus, the, 74.
  sac, excision of, 74.
Lactic acid bacilli for rhinitis, 268.
Laryngeal defects in the voice, 336.
Laryngectomy, 331.
Laryngitis following intubation, 312.
Laryngoptosis, 310.
Laryngotomy, 326.
  technic of, 328.
Larynx, the, 310.
  anatomic supports of, 310.
  bacteria in, 311.
  laryngitis following intubation, 312.
  laryngoptosis, 310.
  laryngectomy, 331.
  laryngotomy, 326.
  lesions in beriberi, 331.
  scleroma of, 324.
  singer's tubercles, 313.
Tuberculosis of, 314.
  tumors of, 324.
Lead poisoning with eye symptoms, 103.
Leech in the trachea, 313.
Lens spots, Mittendorf's, 58.
Leucocytosis in infection of temporal bone, 188.
Leucoma adherens preceding glaucoma, 117.
Lid elevator to prevent loss of vitreous in cataract extraction, 151.
Lip defects in the voice, 332.
Locomotor ataxia, laryngeal manifestations of, 331.
Lues, ocular, 35.
Lumbar anesthesia with tropacocain followed by paralysis, 106.
  puncture in intracranial hyper-tension and its value in the eye complications, 92.
Magazine for blind, 29.
Magnet, giant, in diagnosis, 125.
Massage, suction, apparatus of Stapler, 240.
Mastoid, the, 197.
  differential diagnosis in mastoid diseases, 197.
  mastoiditis, 198.
Mastoiditis following operation for chronic otitis media, 198.
Membrane, Descemet's, see Descemet's.
  perforated, treatment, 195.
  artificial closure of perforated, 197.
Meningitis, eye complications of, 33.
  secondary to chronic otitis media, 207.
Meningococcus from eye, 33.
Mercurol, 162.
Middle ear suppuration with intracranial complications, 212.
Migraine, ophthalmic, and epilepsy, 132.
Mikulicz disease with tuberculous iritis, 71.
Miners' nystagmus, 107.
Mirror, retinoscopic, 9.
  writing, 79.
Mittendorf's lens spots, 58.
Morax-Axenfeld's conjunctivitis, 44.
Motais operation for ptosis, 42.
Mouth, the, 300.
  tuberculosis of, 300.
  of the esophagus, 341.
Multiple sclerosis with optic neuritis, 132.
Mumps, deafness from, 226.
Muscles of the eye, 107.
  paralysis from sinus disease, 109.

Nargol in hay fever, 344.
Nasopharyngitis in children, 297.
Nasopharynx, the, 295.

  inflammation of and neurasthenia, 295.
  relation to ear, 182.
Nerve, auditory, paralysis of, 235.
  death in paralysis of recurrent laryngeal, 313.
  sixth, paralysis from tropacocain, 106.
  isolated paralysis of, 110.
Neurasthenia and pharyngeal inflammation, 295.
Neuritis, optic, in multiple sclerosis, 132.
Nose, air spaces of, 251.
  external, 245.
  fractures and deformities of, 249.
  functional impotency of, 264.
  and genital organs, relation, 294.
  physiology of, 251.
  reflexes of, 292.
  saddle, correction of, 248.
  and throat, the, 245.
  tuberculosis of, 290.
  tumors of, 294.
Novocain, 162, 169.
Nystagmus, hereditary, case of, 107.
  miner's, the visual defect in, 107.

Ophthalmia, atoxyl in, 159.
  sympathetic, 122, 130.
    after ablation of anterior segment of the eye, 130.
    time for enucleation in, 131.
Ophthalmoplegia externa, incomplete congenital, 112.
Ophthalmo-reaction, Calmette, 11.
Optic nerve, the, 79.
  atrophy, an infrequent type, 84.
  diagnosis of affections, 80.
  pathologic excavation of, 117.
Orbit, anesthesia of, 116.
  pistol wound of, 113.
Osteomyelitis complicated by deafness, 234.
Otitis media, 182.
  brain abscess from, 230.
  deafness from, treatment, 195, 197.
  extratympanic complications in, 190.
  intracranial complications, 212.
  meningitis from chronic, 207.
  specific gravity of pus, 198.
  suppurative bilateral with involvement of labyrinth, 228.
  symptoms, 184.
  conservative treatment, 193.
  radical treatment, 194.
  surgical treatment, 192.
Otosclerosis, 221.
  pneumo-massage in, 181.
Over-correction of hypermetropia in treatment of asthenopia, 24.

Painful tic treated by alcohol injections, 113.
Palate, the, 301.
  epithelioma of, 301.
  pemphigus of, 301.
Pannus, gonorrheal pus in, 55.
Paracentesis of the anterior chamber, 72.
Paraffin as embedding material in eye pathology, 15.
  prosthesis in nasal deformities, 245.
  spheres in Tenon's capsule, 113.
Paralysis of auditory nerve, 235.
  of recurrent laryngeal and death, 313.
  of the 6th nerve after lumbar anesthesia with tropacocain, 106.
  isolated paralysis of, 110.
Parinaud's conjunctivitis, 43.
Pemphigus of the palate, 301.
Pharynx, the, 299.
  gangrene of, 299.
Pistol wound of the orbital contents, 113.
Plants, eyes of, 10.

Pneumo-massage in ear diseases, 181.
Pollantin in hay fever, 345.
Polyneuritis, sensory, from influenza, 346.
  treatment, 347.
Potassium iodid in cataract, 59.
Pregnancy, eye complications of, 134.
Protargol, 162.
  causing blindness, 106.
Pterygium knife, a new, 150.
Ptosis, operation for, 41, 42.
Pupils, maximal contraction with loss of reaction to light, 9.
Pus, specific gravity of middle ear, 198.

Quinin anesthesia for tonsil, 307.

Radiotherapy of upper air passages, 348.
Railway accidents and the color sense, 28.
Rays, ultra-violet, effect on eyes, 26.
Reflexes, nasal, 292.
Refraction, 16.
  of wild Indians, 16.
Resection of septum, submucous, 254.
Retina, the, 79.
  cyanosis of, 95.
  hemorrhages of in arteriosclerosis, 133.
  central holes in, 98.
  syphilitic arteries of with optic atrophy, 82.
  tumor of, 146.
Rhinitis, acute, 259.
  atrophic, 265.
  bacterial etiology, 259.
  clinical course of, 267.
  treatment, 267.
  vaccine treatment, 259, 270.
Running ears, 182.

Sac, conjunctival, fluid in, 42.
Saddle nose, correction of, 248.
Sarcoma (?) of the orbit, 146.
Schwartze operation, blood clot method following, 204.
Scleroma of larynx, 324.
Sclerosis, multiple, laryngeal manifestations of, 331.
Septum, the, 254.
  submucous resection, 254.
Serum, antidiphtheritic, in eye infections, 155.
  diagnosis in syphilis of eye, 15.
  therapy in diseases of the eye, 153.
Silver Citrate, 162, 170.
  lactate, 162, 170.
  nitrate with glycerin, 156.
Singer's tubercles, 313.
Sinus and brain, 205.
Sinus, the frontal, 286.
    anomalies of, 286.
    nonsuppurative inflammation of, 286.
    operations on the, 287, 288, 290.
  lateral, curettement of, 221.
  lateral, postoperative involvement of, 218.
  lateral, thrombosis of with recovery, 220.
Sinus disease.
  diagnosis, 282.
  empyema, 282.
  steam inhalations in, 281.
  symptoms of, 281.
  treatment, 281, 282 et seq.
Sinuses, the accessory, 271.
  diseases of as cause of eye troubles, 109, 136.
  drainage of, 272.
  histology of, 274.
  physiology of, 271.
  secretions of, 274.
Sinusitis, see sinuitis.
Sinuitis, frontal, 286.
  endonasal operation for, 288.
  indications for operation, 289.
Sophol in diseases of the eye, 156.
Spectacle frames for infants, 26.

Spirochæta in ocular syphilis, 143.
  pallida in ocular lues, 35.
Spud, an illuminated, 147.
  illuminated eye, and knife needle, 147.
Squint, concomitant, operative treatment of, 112.
Stapes, relation to tympano-mastoid operation, 202.
Staphylococcus infection of eyes, 34.
Staphylococcic vaccine in hypopion-ulcer, 155.
Stapler's suction massage apparatus, 240.
Steel in the vitreous, 124.
  in lower anterior quadrant, 124.
Stovain, 162, 171.
Streptococcus infection of tonsil, 298.
Sublamine, 162, 172.
Submucous resection, 254.
Suction massage apparatus of Stapler, 240.
Suprarenalin, 161.
Sympathetic ophthalmia, see ophthalmia.
Syphilis of eye, atoxyl in, 159.
  diagnosis, 143.
  serum-diagnosis, 15.
Syphilitic arteries of the retina, 82.

Temporal bone, leucocytosis in infection of, 188.
Tenon's capsule, paraffin spheres in, 113.
Tetanus after injury of the eye, 128.
Therapeutics of the eye, 153.
Therapy of nose and throat, 350.
  direct radiotherapy, 348.
  drugs in 351 et seq.
  inhalation, 349.
Thrombosis of the lateral sinus with recovery, 220.
Thymus causing tracheostenosis, 337.
Thyroid extract in interstitial keratitis, 54.
Thyrotomy under local anesthesia, 325.
Tic douloureux from nasal trouble, 293.
  painful, treated by alcohol injections, 113.
Tinnitus and vertigo cured by operative destruction of labyrinth, 237.
Tobacco amblyopia, 98.
Tongue defects in the voice, 333.
Tonsil, the, 298, 301.
  deafness from, 308.
  evolution of the, 301.
  infection from, 305.
  operations on, 306.
  peritonsillar abscess and prolonged suppuration, 310.
  primary diphtheria of, 298.
  quinin anesthesia for, 307.
  streptococcus infection of, 298.
  tonsillectomy and hemorrhage, 308.
  tonsillolith, 309.
  tonsillotomy, death from, 307.
  tuberculosis of, 309.
Tonsillectomy and hemorrhage, 308.
Tonsillolith, a large, 309.
Tonsillotomy, death from, 307.
Torticollis following adenectomy, 299.
Trachea, the, 337.
  a leech in, 313.
  thymic tracheostenosis, 337.
Trachoma, 33.
  atoxyl in, 159.
  origin of, 48.
  treatment of, 48.
  jequirity in, 49.
Tracheostenosis, thymic, 337.
Transillumination of the orbit, 10.
Trichiasis, treatment of, 39.
Trichloracetic acid, 351.
Tropacocain causing paralysis, 106.
  hydrochloria, 162, 174.

Tubercles, singer's, 313.
Tuberculin test, conjunctival, 140.
  ophthalmo-reaction, 11.
  constitutional reaction from, 11.
  contraindications for, 14.
  unfavorable reaction, 12 et seq.
  in tuberculosis of the iris, 72.
Tuberculosis as a cause of ocular disease, 139.
Tuberculosis of the larynx, 314.
  relation to pulmonary, 314.
  treatment, 315.
    anesthesia, 317.
Tuberculosis of the mouth, 300.
  of the nose, 290.
  of the tonsil, 309.
  of the iris treated by tuberculin, 72.
Tumor of the brain and choked disc, 86.
  of the pituitary body without giantism but with binasal hemiopia, 134.
Tumors of the eye, 144.
  of the iris, 22 years old, 145.
  of the orbit, 146.
  of the retina, glioma, 146.
  of the nose, 294.
Turbinals, the, 257.
  inferior, 257.
Turbinate bodies, the, 257.
Tympano-mastoid operation, 202.
Typhoid, ocular reaction, 15.
Ulcer of cornea, an instrument for cauterizing, 151.
Ulcers, corneal, 54.
Ultra-violet rays, injury to eye, 26.
Uveal tract, the, 70.
  paracentesis in inflammation of, 72.

Vaccine, antistaphylococcic, 155.
  staphylococcic, in hypopion-ulcer, 155.
  therapy for rhinitis, 259, 270.
  treatment of staphylococcus infection of eyes, 34.
Velum defects in the voice, 335.
Venesection in relapsing intraocular hemorrhage, 72.
Verhoeff's astigmatic charts, 17.
Vertigo and tinnitus cured by operative destruction of labyrinth, 237.
Vitreous, steel in the, 124.
Voice, the, 332.
  laryngeal defects, 336.
  lip defects, 332.
  tongue defects, 333.
  velum defects, 335.

Wasserman test in ocular syphilis, 143.
Wood alcohol blindness, 99.
Writing, mirror, 79.

Ziegler magazine for the blind, 29.
Zonular opacity of cornea, 55.

INDEX OF AUTHORS.

Allen, R. W., 259.
Allesandro, 72.
Anders, J. M., 309.
Ammann, 54.
Andrews, A. H., 202.
Ard, F. C., 307.
Arlt, 158.
Asmus, 125.
Ayres, S. C., 123.
Axenfeld, 139, 153.
Babinski, 93.
Bagh, 133.
Bargy, 159.
Barrett, J. W., 292.
Barth, E., 314.
Beaumont, 70.
Beck, J., 249.
Beck, J. C., 249, 290.
Berg, 230.
Bishop, L. F., 238.

Blok, 67.
Blysma, 23.
Bock, 156.
Bond, J. W., 301.
Boot, G. W., 226, 228.
Borghetti, 56.
Bourack, S. M., 319.
Bowen, 125.
Bradburne, 9.
Brawley, Frank, 14, 286.
Brose, 130.
Brown, E. J., 307.
Bryant, Alice G., 298.
Bryant, W. S., 182, 190.
Buchanan, 79, 123.
Bull, C. S., 137.
Burvill-Holmes, E., 270.
Butler, 39.
Butler, T. H., 11.

Carhart, 30, 101.
Carson, 147.
Carter, W. W., 249.
Caspar, 107.
Chaillous, 93.
Chamberlain, W. B., 195.
Citelli, 299.
Coats, 50.
Cobb, C. M., 178.
Cohen, 15.
Cohen, M., 286.
Cohn, F., 192.
Collin, 14.
Corbus, B. C., 35, 143.
Cosmetattos, 157.
Curtis, H. H., 268, 269.

Darier, 158, 171.
Davis, 38.
Davis, A. E., 51.
Dench, E. B., 197, 198.
Denig, 72.
Derby, 139.
Dickey, 124.
Donovan, 127.
Dowling, 98.
Druais, 43.
Duane, 21.
Dufour, C. R., 308.
Duncan, J. L., 65.
Dunn, Percy, 24.
Egbert, 48.
Elliott, Major, 76.
Elsching, 46.
Elze, 129.
Emerson, F. E., 179.
Escat, E., 346.
Ewing, 150.
Ewing, F. C., 350.

Fischer, L., 185.
Fitzgerald, W. H., 351.
Foy, R., 264.
Frankel, 92.
Fraenkel, B., 325.
Frankenburger, O., 311.
Frantz, 54.
Frese, O., 266.
Freudenthal, W., 331.
Fridenberg, 24.
Friedenwald, 80, 220.

Galtier, 158.
Gerst, E., 290.
Gifford, 58, 159.
Gillman, 49.
Giresse, F. C., 298.
Glover, J., 312, 313.
Goldzieher, 55.
Gontermann, 106.
Grace, Ralph, 344.
Gratiot, 22.
Greef, 32, 48.
Green, John, Jr., 17, 123.
Greene, D. C., 326.
Grey-Edwards, 155.
Groenouw, 145.
Gunn, 86.

Haberlandt, Prof., 10.
Hajek, M., 289.
Hald, P. Tetens, 198.
Hall, 38.
Hamburger, Walter, 15.
Hansell, Howard, 79, 84.
Harman, 156.
Harman, B., 26.
Harris, F. G., 35, 143.
Haseltine, Burton, 199.
Hay, 142.
Heath, 55.
Hecht, A., 297.
Hempel, H., 282.
Herbert, 119.

Herbert, C. H., 63.
Hertzell, 10.
Heryng, Theodor, 321, 349.
Herzig, A. J., 184.
Hess, 105.
Hill, William, 197.
Hilbert, 104.
von Hippel, E., 118, 122.
Hollopeau, 160.
Holloway, 85.
Holmes, E. M., 294.
Hopkins, F. E., 351.
Horn, H., 258.
Horsley, 91.
Hotz, 40.
Hubbell, 132.
Hulen, 69.
Hurd, L. M.

Imre, 172.

Jackson, 136.
Jackson, Edward, 66, 74.
Jansen, A., 287.
Jobson, G. B., 151.
Johnston, R. H., 339.
Jones, C. P., 16, 205.
Jung, 126.

Kanasugi, H. E., 293, 331.
Kerrison, P. D., 207.
Killian, G., 341.
Knapp, Arnold, 63.
Koblanck, 294.
Koellner, 110.
Kopetzky, S. J., 212.
Körner, O., 193.
Korter, 146.
Krailscheimer, 71.
Kramer, J., 316.
Krauss, 82.
Krauss, F., 106.
Kuhnt, 112.
Kuttner, A., 293.
Kyrieleis, 72.

L'Ancona, 144.
Lapersonne, 12.
Large, S. H., 270.
Laub, L., 314.
Leshure, J., 353.
Lesser, 57.
Lewis, Park, 106.
Loewenstein, 116.
Macdougal, 10.
Mackay, Geo., 136.
Maddox, 155.
Mader, 348.
Mannheimer, 140.
Martens, 282.
Martin, 53.
May, 135.
Mayer, E., 324, 346.
Mayou, 34.
MacKenty, J. E., 254.
McCullough, S., 204.
McKee, 33.
McKee, Hanford, 44, 48.
McKernon, J. F., 182, 218.
Mead, 136.
Meller, 119.
Mermod, 271.
Mink, P. J., 252.
Moore, T. W., 283.
Moraweck, 151.
Morax, 41.
Moure, E. J., 325.
Mueller, F., 343.
von zur Muhlen, A., 282.

Napier, 12.
Neufeld, L., 299.
Newolina, 113.

Ollendorff, 74.

Page, L., 331.
Parsons, 83.
Patrick, Hugh, 113.
Patterson, J. A., 314.
Perez, F., 266.
Pfalz, 40.
Pflugk, 59.
Pollock, 15, 25.
Pooley, 61.
Posey, 47, 82.
Pratt, Chas. N., 114.
Prince, A. E., 49.

Quincke, H., 310.

Radcliffe, 54.
Ramsay, Maitland, 13.
Reamer, E. F., 285.

Reber, 21.
Redlich, 9.
Rethi, L., 292.
Richardson, C. W., 256.
Riek, J. N., 308.
Risley, Sr., 52, 137.
Robinson, Beverly, 314.
Robinson, George, 89.
Roe, J. O., 249.
Roth, W., 310.
Roy, 146.
Roy, Dunbar, 177.
Royet, 295.
Roune, 69.
Rupprecht, 122.

Sachs, 230.
Schanz, 26.
Scheibe, 194.
Schirmer, 42.
Schnabel, 117.
Schneider, 146.
Schöbl, 83.
Schoeler, F., 43.
Schöler, 64.
de Schweinitz, 85.
Schwinn, J., 337.
Scott, S. R., 210.
Scripture, E. W., 332.
Sebileau, P., 310.
Shoemaker, 42.
Shoemaker, J. F., 109.
Siebenmann, 234.
Sirieys, 66.
Skillern, R. H., 270, 288.
Smith, Harmon, 245.
Smith, Major H., 62.
Smith, S. MacCuen, 188.
Snell, 107.
Snell, A. C., 147.
Spiess, G., 316.
Spratt, 124.
Spratt, C. N., 20.
Stapler, M. M., 240.
Stein, O. J., 308, 343.
Steiner, M., 265.
Stephenson, 112.
Stock, 122.
Stieren, Edward, 91.
Stilling, 118.
Stratton, 28.
Straub, 133.
Stricker, Louis, 99.
Stubbs, F. G., 235.
Syme, W. S., 203.

Tapia, 313.
Thompson, Ernest, 11.
Tilley, H., 283.
Todd, F. C., 345.
Todd, Frank, 151.
Tooke, 127.
Treacher-Collins, 58.
Trousseau, 12, 130.
Turner, Logan, 138.
Tweddie, A. R., 221.
Twietmeyer, 98.
Tyson, 95.

Ullrich, 74.

Valk, 152.
Valude, 113, 131.
Voght, 27.
Voss, F., 221.

Waxham, F. E., 248
Weill, 70.
Whiting, F., 215.
Wicherkiewicz, 128.
Willis, E. A., 300.
Wilson, N. L., 309.
Winter, 263.
Wirsing, 103.
Wishart, D. J. G., 308.
Wood, Casey, 134.
Wood, Geo. B., 305.
Woods, Hiram, 134.
Wright, Jonathan, 302.
Würdemann, H. V., 153, 257.

Yankauer, S., 272.
Yearsley, M., 181, 237.
Yonge, E. S., 342.
Young, 150.